APPENDIX L

PRELIMINARY BIOLOGICAL ASSESSMENT

This page intentionally left blank

N-12 Niobrara East and West Project

Biological Assessment

NDOR Project No. S-12-5(1011)
CN 31674
HDR Project No. 84534

October 2015

Contents

Tables

Figures

Appendices

1 Project Overview

The U.S. Army Corps of Engineers (Corps) is preparing an Environmental Impact Statement (EIS) for the proposed reconstruction of the Nebraska Highway 12 (N-12) roadway east and west of the Village of Niobrara (Niobrara), Nebraska (project). As part of the N-12 Draft EIS and in compliance with Section 7 of the Endangered Species Act of 1973, as amended (ESA) (16 United States Code [USC] 1531-1544), this Biological Assessment (BA) has been prepared to address potential effects on federally listed threatened, endangered, proposed, and candidate species from construction, operation, and maintenance of the project.

Specifically Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. Under Section 7, Federal agencies must consult with the U.S. Fish and Wildlife Service (USFWS) when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species. This process usually begins as informal consultation. A Federal agency, in the early stages of project planning, approaches the Service and requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species.

If the Federal agency, after discussions with the USFWS, determines that the proposed action is not likely to affect any listed species in the project area, and if the USFWS concurs, the informal consultation is complete and the proposed project moves ahead. If it appears that the agency's action may affect a listed species, that agency may then prepare a biological assessment to assist in its determination of the project's effect on a species (USFWS 2015a).

The project applicant, the Nebraska Department of Roads (NDOR), submitted an application on September 11, 2015 to the Corps for a Clean Water Act Section 404 permit to build the project, located in Knox County, Nebraska. Construction of the project would involve the discharge of fill material into waters of the U.S., including wetlands, and NDOR is requesting authorization from the Corps under Section 404 of the Clean Water Act for the discharge. The Corps is the lead federal agency for the N-12 Draft EIS and Section 7 consultation with USFWS.

Included in this BA is a description of the project (Section 1.1), a description of the existing conditions in the Action Area (Section 2.1), and an analysis of potential impacts from the project on federally listed species (Section 4.0).

1.1 Project Description

The N-12 Draft EIS describes the social, economic, and environmental resources potentially affected by the Proposed Action (that is, the action proposed by NDOR, the applicant), as well as several alternatives, including a No-Action Alternative. The alternatives are described and illustrated in Chapter 2 of the N-12 Draft EIS. While the No-Action Alternative and four Action Alternatives were carried forward in the N-12 Draft EIS and are described below, this BA analyzes the potential effects of only NDOR's Applied-for Project, Alternative A7, Base of Bluffs Elevated Alignment.

1.1.1 No-Action Alternative

Evaluation of the No-Action Alternative is required in an EIS (40 Code of Federal Regulations [CFR] 1502.14(d) and 1508.25(b)). The No-Action Alternative is used as a benchmark for comparison of the environmental effects of the Action Alternatives. Under the No-Action Alternative, for comparative purposes, it is assumed that neither the Applied-for Project nor any of the Action Alternatives would be implemented. In this scenario, it is assumed that NDOR would continue to maintain N-12 for traffic and make improvements to correct the design deficiencies that have been created due to past flood events. Maintenance activities that impact jurisdictional wetlands or other waters of the U.S. would require a federal action from the Corps. Actions within the 39-mile District of the MNRR that impact jurisdictional wetlands or other waters of the U.S. would require a federal action from the Corps and/or the NPS. These federal actions would also require compliance with NEPA and would be evaluated on each independent action. Future maintenance activities associated with the No-Action Alternative requiring a federal action are not evaluated in this Draft EIS or in this BA.

1.1.2 Alternative A1, Elevation Raise on Existing Alignment

Alternative A1 involves raising the existing N-12 roadway on the current alignment for both the east and west segments to an elevation approximately 9.5 feet above the projected water surface elevation of the Missouri River 50-years into the future (based from 2013) during a 100-year flood event (including compensation for potential wave action, assumed to be 3.5 feet) (NDOR 2013). This is approximately 14 to 15 feet higher than existing N-12. In addition the roadway would be widened (12 foot driving lanes, 8- to 10-foot shoulders, and sloping embankments), and curvature and ingress and egress considerations for county roads and private access would be modified to satisfy current NDOR design standards and to facilitate an adequate level of service for east-west traffic.

Traffic would be maintained on a two-lane temporary roadway through the construction zone, providing the least disruption to local and regional traffic and the best service to the public compared to a detour option (Niobrara Public Schools 2009) with no net increase in permanent impacts on wetlands. Existing intersections with county roads and private crossings would remain open during construction to the greatest extent possible.

1.1.3 Alternative A2, Elevation Raise on Parallel Alignment

Alternative A2 involves constructing the road on a raised-elevation alignment parallel and adjacent to existing N-12 for both the east and west segment. Portions of this alternative would be constructed north of existing N-12 while other portions would be constructed south of existing N-12, dependent on site constraints and design requirements.

This alternative would be constructed at an elevation approximately 8.5 feet and 9 feet above the projected water surface elevation of the Missouri River 50-years into the future (based from 2013) during a 100-year flood event (including compensation for potential wave action, assumed to be 3.5 feet) (NDOR 2013). Roadway design would involve 12-foot driving lanes, 8- to 10-foot shoulders.

A wave attenuation berm that would range in length (15-foot minimum) would be incorporated on the north side of the roadway into those sections where the new highway embankment would be shifted to the south of the existing highway section. The wave attenuation berm with a vegetative wave break was designed to take advantage of the existing highway embankment where applicable.

Where the new highway embankment would be located along (Existing Alignment) or located north of (Parallel Alignment) the existing highway, a standard 3:1 embankment section would be used with rock riprap placed along the 3:1 slope of the embankment (NDOR 2009b). These design features satisfy current NDOR design standards and would facilitate an adequate level of service for east-west traffic.

The new roadway would be constructed with an offset alignment. The offset alignment, in association with a system of shoofly connections and temporary roads, would maintain traffic on both lanes of the existing roadway during construction. Existing intersections with county roads and private crossings would remain open during construction to the greatest extent possible.

1.1.4 Alternative A3, Base of Bluffs Alignment

Alternative A3 would shift the roadway alignment south to the base of the Missouri River bluffs and would be a new travel corridor. However, there are many locations where this alternative's alignment is identical to Alternative A1 or A2 due to the proximity of the bluffs to the Missouri River. In the west segment, this alternative would deviate from the existing N-12 alignment just east of Ponca Creek and would rejoin the existing alignment just north of County Road 892. In the east segment, the alignment would deviate from the existing alignment east of 4th Avenue in Niobrara, NE and would reconnect with existing N-12 at approximately S-54D. A new connection to the Chief Standing Bear Memorial Bridge (N 14) and SD-37 would be developed.

Although still in the 100-year floodplain of the Missouri River, as designated by the Federal Emergency Management Agency (FEMA), this alternative moves the alignment to the southern extreme of the floodplain where possible. A new connection to the Chief Standing Bear Memorial Bridge (N 14) and SD-37 would be developed. For both segments, where the new alignment deviates from the exiting N-12 alignment, the N-12 roadway would be removed to the existing ground level. Roadway removal includes all pavement and roadway embankment.

This alternative would be constructed at an elevation approximately 9 feet and 11.5 feet above the projected water surface elevation of the Missouri River 50-years into the future (based from 2013) during a 100-year flood event (including compensation for potential wave action, assumed to be 3.5 feet) (NDOR 2013). Roadway design would involve 12-foot driving lanes, 8- to 10-foot shoulders. Construction of a road at the A3 location would include total elimination of the entire existing N-12 roadway embankment; therefore, no wave attenuation berm would be incorporated. Segments of this alternative within the floodplain would use a standard 3:1 embankment section with rock riprap placed along the 3:1 slope of the embankment (NDOR 2009b). These design features satisfy current NDOR design standards and would facilitate an adequate level of service for east-west traffic

The new roadway would be constructed on a predominantly new alignment. The new alignment, in association with a system of shoofly connections and temporary roads, would maintain traffic on both lanes of the existing roadway during construction. Existing intersections with county roads and private crossings would remain open during construction to the greatest extent possible.

1.1.5 NDOR's Applied-for Project — Alternative A7, Base of Bluffs Modified Elevated Alignment

This alternative is the same alignment as Alternative A3, but incorporates 9,302 feet (1.8 miles) of bridges. This alternative would shift the roadway alignment south to the base of the Missouri River

bluffs and would be a new travel corridor. However, there are many locations where this alternative's alignment is identical to Alternative A1 or A2 due to the proximity of the bluffs to the Missouri River. In the west segment, this alternative would deviate from the existing N-12 alignment just east of Ponca Creek and would rejoin the existing alignment just north of County Road 892. In the east segment, the alignment would deviate from the existing alignment east of 4th Avenue in Niobrara, NE and would reconnect with existing N-12 at approximately S-54D. A new connection to the Chief Standing Bear Memorial Bridge (N 14) and SD-37 would be developed.

Although still in the 100-year floodplain of the Missouri River, as designated by the Federal Emergency Management Agency (FEMA), this alternative moves the alignment to the southern extreme of the floodplain where possible. A new connection to the Chief Standing Bear Memorial Bridge (N 14) and SD-37 would be developed. For both segments, where the new alignment deviates from the exiting N-12 alignment, the N-12 roadway would be removed to the existing ground level. Roadway removal includes all pavement and roadway embankment.

This alternative would be constructed at an elevation approximately 9 feet and 11.5 feet above the projected water surface elevation of the Missouri River 50-years into the future (based from 2013) during a 100-year flood event (including compensation for potential wave action, assumed to be 3.5 feet [NDOR 2013]). Roadway design would involve 12 foot driving lanes, 8- to 10-foot shoulders. Construction of a road at the A3 location would include total elimination of the entire existing N-12 roadway embankment; therefore, no wave attenuation berm would be incorporated. Segments of this alternative within the floodplain would use a standard 3:1 embankment section with rock riprap placed along the 3:1 slope of the embankment (NDOR 2009b). These design features satisfy current NDOR design standards and would facilitate an adequate level of service for east-west traffic

The new roadway would be constructed on a predominantly new alignment. The new alignment, in association with a system of shoofly connections and temporary roads, would maintain traffic on both lanes of the existing roadway during construction. Existing intersections with county roads and private crossings would remain open during construction to the greatest extent possible.

1.2 Study Area and Action Area

The Study Area for the N-12 project is located in northeastern Nebraska, near Niobrara in Knox County, as shown in Figure 1. The Study Area extends west to the town of Verdel, Nebraska, and east to the intersection of N-12 and County Road 531. The Study Area extends to the north of the existing alignment of N-12 and to the south of the bluffs alignment. The Study Area includes all water bodies potentially affected by the Action Alternatives. The water bodies include Bazile Creek, Ponca Creek, Harry Miller Creek, Medicine Creek, other unnamed tributaries to the Missouri River, and the floodplain wetlands that are connected to the Missouri River. The Niobrara River and the Missouri River main channel are not located within the permanent area of impact[1] of any of the alternatives.

The Action Area considered in this BA is defined as the geographic area within which the direct or indirect effects (physical, chemical, and/or biotic) of the project would occur (50 CFR 402.2), and largely consists of NDOR's proposed action, the existing N-12 roadway, and bordering land on either

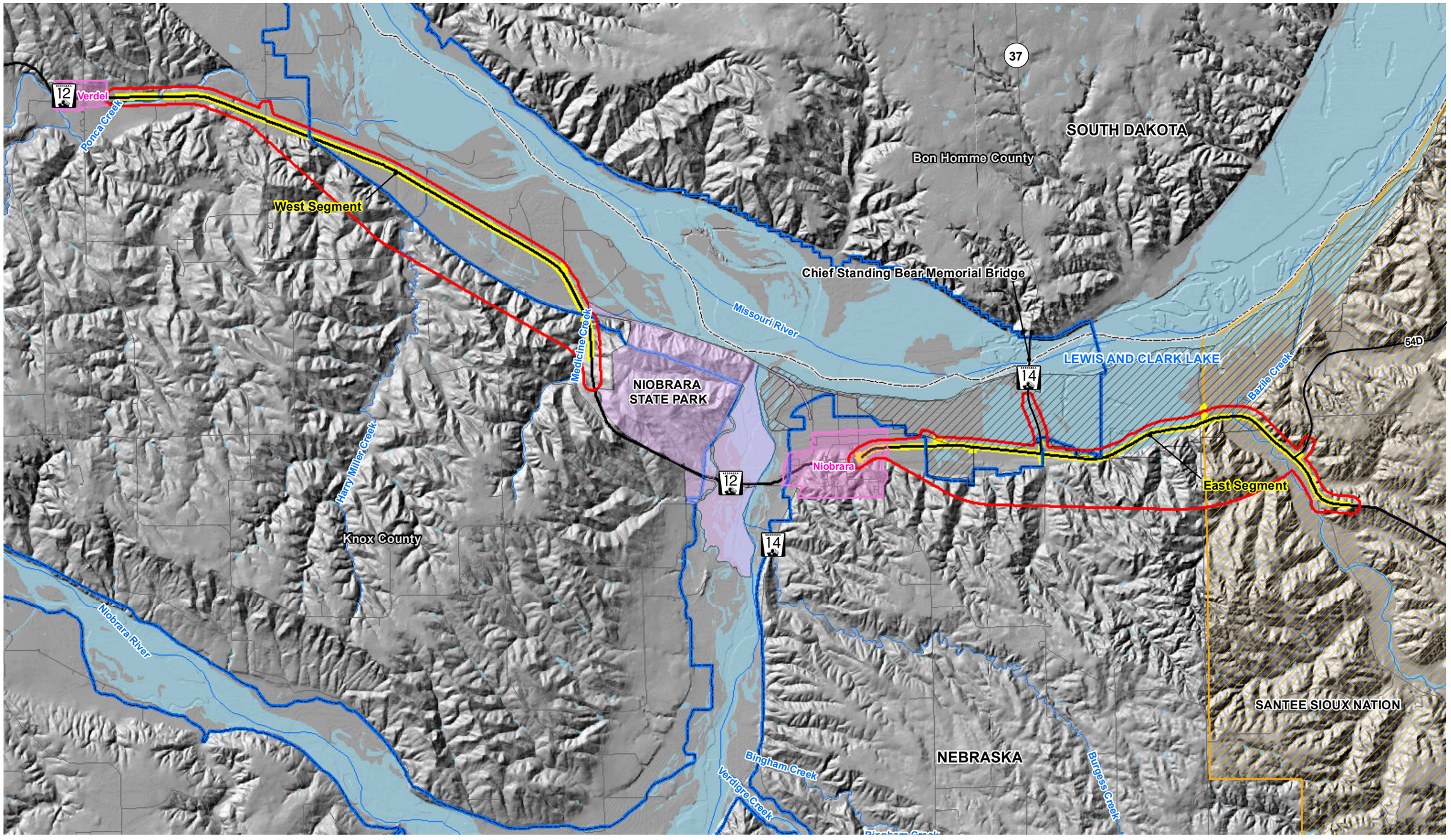
[1] The permanent area of impact for the A7 Alternative is the area of the project that would be changed during construction and not restored to its original state. This includes areas of fills, cuts, channel re-alignments, or other permanent changes to the landscape.

side of the proposed action alignment (see Figures 2a and 2b, Action Area and Alternative A7 Permanent Area of Impact). The project elements and potential construction methods, including equipment that may be used, were identified and analyzed for potential impacts on the environment. Project elements that were considered include removal of the existing N-12 pavement through the floodplain, re-alignment and construction of the new roadway, construction of new culverts and replacing or extending existing culverts and bridges, removal of vegetation for construction, and re-planting of vegetation post-construction.

A review of the aforementioned elements revealed that potential project impacts could include disturbance of wildlife due to construction noise and activity, loss of terrestrial and wetland habitat, and degradation of aquatic habitat due to increased sedimentation. The potential noise impacts would cover the largest area, whereas direct impacts (habitat loss) would only occur within the permanent area of impact (the area occupied by the completed roadway, including the cut bank, fill slope, and the area cleared for the purpose of constructing the roadway). Impacts on surface waters would be localized and minimized by best management practices (BMPs). Although BMPs are expected to prevent water quality impacts, a failure of BMPs during an intense precipitation event could potentially affect water quality in the Missouri River tributaries located throughout the project, up to approximately 100 feet downstream. Because the potential extent of construction-noise impacts extends farther than the area potentially affected by water quality, the distance to ambient noise was estimated at 0.25 mile and used to define the extent of the Action Area. The 0.25-mile distance was used because USFWS in the State of Nebraska typically sets this as a disturbance limit for construction noise on nesting interior least terns (*Sterna antillarum athalassos*) and piping plovers (*Charadrius melodus*).

The Action Area occurs in two watersheds: Lewis and Clark Lake (HUC8 10170101) and Ponca (HUC8 10150001), which drains into the Lewis and Clark Lake watershed (see Figures 2a and 2b). Several perennial streams also occur in the Action Area. The Action Area includes the floodplain of the Missouri River surrounding the existing roadway and the proposed roadway. The Action Area also includes perennial tributaries joining the Missouri River that would require bridge and culvert construction. See Figures 2a and 2b for the limits of the Action Area.

This page intentionally left blank



Knox County, Nebraska

Aerial Imagery: 2006 NAIP, Knox County, Nebraska

Legend

- N-12 Segments
- Nebraska Highway 12
- Roads
- Study Area
- Waterways
- City Limits
- Counties
- Wildlife Management Areas
- Recreational River Boundary
- Santee Sioux Nation
- Niobrara State Park

1 0.5 0 1
Miles

Project Study Area

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

NEBRASKA 12 N-12 Niobrara East & West

DATE
October 2015

FIGURE
1

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Study_Area_Map_Fig_1_2.mxd

Missouri River

Bazile Creek

Niobrara

Lewis and Clark Lake

Lower Niobrara

14

12

54D

Knox County, Nebraska

Legend

- Existing Alignment
- Alternative A7
- Action Area
- HUC8 Boundary
- Roads
- Waterway
- 100-Year FEMA Floodplain
- Santee Sioux Nation
- County Line
- City Limit

0 1,000 2,000 Feet

Action Area and Alternative A7 Permanent Area of Impact

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12 N-12 Niobrara East & West

DATE
October 2015

FIGURE
2a

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Action_Area_Fig2a.mxd

Missouri River

Bazile Creek

Niobrara

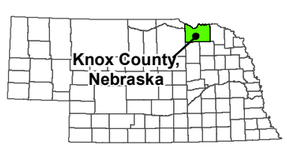
Lewis and Clark Lake

Lower Niobrara

14

12

54D



Legend

- Existing Alignment
- Alternative A7
- Action Area
- HUC8 Boundary
- Roads
- Waterway
- 100-Year FEMA Floodplain
- Santee Sioux Nation
- County Line
- City Limit

N

0 1,000 2,000
Feet

Action Area and Alternative A7 Permanent Area of Impact

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12
N-12 Niobrara East & West

DATE
October 2015

FIGURE
2b

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Action_Area_Fig2a.mxd

This page intentionally left blank

1.3 Consultation History

Informal consultation with USFWS was initiated by the Corps at the agency scoping meeting on August 28, 2008. In response to a written request from the Corps, USFWS provided a list of federally listed species potentially occurring in the Action Area for the project and identified other issues that should be addressed in this BA in a letter dated November 18, 2009. Due to the length of time since that consultation, in August 2011, the Corps requested concurrence on an updated list of threatened, endangered, proposed, or candidate wildlife and plant species and any designated critical habitat occurring within the Study Area. The Corps received a letter from USFWS on September 1, 2011, concurring with the previously submitted species list. Finally the latest species list was received from USFWS on May 1, 2015.

2 Federally Threatened, Endangered, Proposed, or Candidate Species Potentially Affected by the Project

2.1 Existing Conditions in the Action Area

The proposed N-12 alignment would cross through the Missouri River floodplain wetlands, adjacent uplands, and agricultural areas. The Action Area is located within the Mixedgrass Prairie Ecoregion, which "lies between the Tallgrass Prairie Ecoregion to the east and the Shortgrass Prairie Ecoregion to the west" (Schneider et al., 2011). The Mixedgrass Prairie Ecoregion is a transition zone where the Tallgrass and Shortgrass Prairie Ecoregions merge, so it takes on characteristics of both (Schneider et al., 2011). "Plant composition varies considerably depending on soil type, topography, weather influences, and land use" (Schneider et al., 2011). The Mixedgrass Prairie Ecoregion's highly diverse flora and fauna include a mix of species also found in the Tallgrass and Shortgrass Prairie Ecoregions (Schneider et al., 2011).

The Action Area lies within two of Nebraska's Biologically Unique Landscapes, as described by the Nebraska Natural Legacy Project (Schneider et al., 2011) and shown in Figure 3. A Biologically Unique Landscape is a specifically selected landscape that offers some of the best opportunities for conserving the full array of biological diversity in Nebraska. Landscapes were selected based on known occurrences of ecological communities and at-risk species and were selected to meet the goals that the Nebraska Game and Parks Commission (NGPC) had set for each community type and Tier I[2] species (Schneider et al., 2011).

[2] Tier I species are those that are globally or nationally at risk. They meet one or more of the following criteria: 1) federally and state listed species; 2) ranked by NatureServe and the international Natural Heritage Network as either globally critically imperiled, globally imperiled, or globally vulnerable; 3) declining species; 4) endemic species; and/or 5) disjunct species (Schneider et al., 2011).

This page intentionally left blank

Verdel

12

37

Missouri River

Verdigre-Bazile Watershed

Verdigre-Bazile Watershed

14

Niobrara

12

14

Verdigre-Bazile Watershed

Lower Niobrara River

Knox County, Nebraska

Legend

- Existing Alignment
- Action Area
- Biologically Unique Landscapes
- County Line
- City Limit

0 0.5 1 Miles

Biologically Unique Landscapes

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12 N-12 Niobrara East & West

DATE
October 2015

FIGURE
3

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxdFinal\EIS_Figures\BioUniqueLandFigure3.mxd

This page intentionally left blank

The Lower Niobrara River Biologically Unique Landscape "includes the Niobrara River channel and a two-mile buffer on each side of the river from central Brown County eastward to its confluence with the Missouri River in Knox County. The river in this reach has a broad, braided, and somewhat shallow channel" with many open sandbars and wooded islands (Schneider et al., 2011). Much of the valley bottom is in crop production, although some areas support cottonwood and bur oak woodlands. Some wet meadows and marshes remain in the floodplain. The bluff slopes are mainly mixedgrass prairie with some oak woodlands in the west. Sandbars on the lower stretch of the Niobrara River from Holt County eastward support colonies of the federally and state-listed interior least tern and piping plover. Bald eagles (*Haliaeetus leucocephalus*) are also known to nest along this reach of the Niobrara River (Schneider et al., 2011). Twelve Tier I at-risk species can be found in the Lower Niobrara River Biologically Unique Landscape: prairie moonwart (*Botrychium campestre*), northern river otter (*Lontra canadensis*), Bell's vireo (*Vireo bellii*), interior least tern, long-billed curlew (*Numenius americanus*), piping plover, whooping crane (*Grus americana*), wood thrush (*Hylocichla mustelina*), Iowa skipper (*Atrytone arogos iowa*), ottoe skipper (*Hesperia ottoe),* regal fritillary (*Speyeria idalia*), and pallid sturgeon (*Scaphirhynchus albus*) (Schneider et al., 2011).

The Verdigris-Bazile Biologically Unique Landscape occupies the watersheds of Verdigris Creek and Bazile Creek in Cedar, Knox, Holt, and Antelope counties. The streams are spring-fed coldwater streams that have unique fish assemblages, such as Iowa darters, Johnny darters, plains topminnow, and western silvery minnow. These watersheds contain a mosaic of cropland, restored native and exotic cool-season grasslands, and native tallgrass and mixedgrass prairie. Most of the prairies have been somewhat degraded by use of livestock grazing regimes that reduce native species diversity and promote exotic plant invasion. Oak woodlands are common along the streams and in ravines. The northern portion of the landscape includes Missouri River bluffs and breaks. These areas support northern loess/shale bluff prairie, tallgrass prairie, and deciduous woodlands. The Santee Sioux Indian Reservation is located within this portion of the landscape (Schneider et al., 2011). Fifteen Tier I at-risk species are identified as occurring within the Verdigris-Bazile Biologically Unique Landscape: prairie moonwart, Bell's vireo, buff-breasted sandpiper (*Tryngites subruficollis*), burrowing owl (*Athene cuniculari*), greater prairie-chicken (*Tympanuchus cupido*), interior least tern, piping plover, whooping crane, wood thrush, American burying beetle (*Nicrophorus americanus*), Iowa skipper, ottoe skipper, regal fritillary, plains topminnow (*Fundulus sciadicus*), and plains pocket mouse (*Perognathus flavescens*), (Schneider et al., 2011).

To determine land use, the Action Area was superimposed on aerial photographs and overlaid with the 2011 National Land Cover Database coverage (USGS 2014) to categorize habitat types using ArcGIS software. NDOR's wetland delineation data were used to identify wetlands and other waters of the U.S. (see Appendix F). A visual windshield survey was conducted on September 28 and 29, 2008 to verify the documented habitats. Habitat types are defined in the Fish and Wildlife Technical Memorandum (see Appendix D).

Wetland resources beyond the Action Area were evaluated based on aerial photographs and habitat mapping conducted by the Corps (2011). Based on this wetland mapping, there are approximately 4,764 acres of wetland habitat directly connected to the Missouri River from Bazile Creek to Santee, Nebraska (Corps 2011). Additionally, based on the UNL 2005 Land Use Coverage and the NDOR determinations, there are approximately 1,414 acres of wetlands within the Study Area from Ponca Creek downstream to Bazile Creek, which yields a conservative total of approximately 6,100 acres of wetlands between Ponca Creek and Santee, Nebraska

2.2 Species Evaluated

Eight species of wildlife known to occur, or potentially occurring, within the Action Area are protected as endangered or threatened species or are under review for such status under the ESA (see Table 2-1). The ESA affords protection to those species determined either endangered or threatened, and their habitats. As defined by the ESA, an endangered species is "any species which is in danger of extinction throughout all or a significant portion of its range" (16 USC 1532). A threatened species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (16 USC 1532). Under the ESA, it is illegal to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect listed endangered or threatened species. Violations of the ESA can result in substantial civil or criminal penalties, including fines and/or imprisonment.

Candidate species are wildlife and plants for which USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by higher priority listing activities (USFWS, March 2011). Proposed species are those candidate species that were found to warrant listing as either threatened or endangered and were officially proposed as such in a Federal Register notice after the completion of a status review and consideration of other protective conservation measures (Office of Protected Resources, December 12, 2011). Currently, no known proposed or candidate species are listed in the Action Area.

Table 2-1. Threatened, Endangered, Proposed, or Candidate Species that May Occur in the Action Area or May Be Affected by the Project

Common Name[1]	Scientific Name	Federal Status[2]	State Status[2]	Habitat	Potential for Occurrence
Insects					
American burying beetle	*Nicrophorus americanus*	E	E	Riparian zone, mixed agricultural land (pastures and mowed land), grasslands, woodland edge habitat	No known occurrences in the Action Area. Grasslands and woodlands in the Action Area provide potentially suitable habitat.
Birds					
Interior least tern	*Sterna antillarum athalassos*	E	E	Sparsely vegetated sandbars, sand and gravel shorelines of rivers, alkali wetlands	Likely to occasionally forage in the Action Area, but no suitable nesting habitat is present.
Piping plover	*Charadrius melodus*	T	T	Sparsely vegetated sandbars, sand and gravel shorelines of rivers, alkali wetlands	No suitable nesting or foraging habitat is present within the Action Area.
Rufa red knot	*Calidris canutus rufa*	T	T	Sandflats, mudflats, peat-rich banks, salt marshes, brackish lagoons, mangrove areas, and mussel beds	No bare sand or gravel areas exist within the Action Area.
Whooping crane	*Grus americana*	E	E	Palustrine wetlands for loafing and foraging during migration; submerged sandbars in rivers for roosting	May use Action Area during migration for foraging and resting.
Fishes					
Pallid sturgeon	*Scaphirhynchus albus*	E	E	Main channel of turbid, free-flowing rivers, backwaters, chutes, edges of sandbars	No suitable habitat is present within the Action Area.
Plants					
Western prairie fringed orchid	*Platanthera praeclara*	T	T	Wet-mesic to mesic tallgrass prairie, unplowed sedge meadows	No suitable habitat is present within the Action Area.
Mammals					
Northern long-eared bat	Myotis septentrionalis	T	T	In summer, roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags	No known occurrences in the Action Area. Woodlands in the Action Area provide potentially suitable habitat.

Notes:

[1] These species were included based on letters (USFWS, November 18, 2009; USFWS, September 1, 2011; USFWS, May 1, 2015; NGPC, January 15, 2010; NGPC, January 29, 2010; and NPGC, June 11, 2015), meetings, and discussions with USFWS (see Appendix A).

[2] E = endangered; T = threatened

Sources:

NatureServe, 2009. "NatureServe Explorer: An Online Encyclopedia of Life" [web application]. Version 7.1. Arlington, Virginia: NatureServe. Retrieved on February 6, 2009. http://www.natureserve.org/explorer.

NGPC. March 2014. Estimated Current Ranges of Threatened and Endangered Species: List of Species by County. Nebraska Natural Heritage Program. http://outdoornebraska.ne.gov/wildlife/programs/nongame/pdf/TandESpecies.pdf.

USFWS. 2015b. Endangered, Threatened, Proposed and Candidate Species, Nebraska Counties. Nebraska Field Office. March. http://www.fws.gov/nebraskaes/Library/NECounty2015.pdf.

Critical habitat identifies specific geographic areas that are essential to the conservation and recovery of the species and may require special management considerations. Critical habitat does not create preserves or refuges, and only affects projects requiring a federal decision. Critical habitat includes only those areas that contain the "primary constituent elements" or the habitat components necessary for the essential life-cycle needs of the species (50 CFR 424.12(b)). However, as described in the following sections, there is no critical habitat designated within the Action Area for any of the species described herein.

2.2.1 American Burying Beetle

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

The American burying beetle (*Nicrophorus americanus*) (ABB) was federally listed as endangered on July 13, 1989 (54 Federal Register [FR] 29652-29655). In 1991, USFWS issued a recovery plan for the ABB. On January 29, 2007, USFWS initiated a 5-year review of this species (72 FR 4018-4019). The 5-year review for the ABB was completed and published on June 16, 2008. In this review, USFWS recommended that no change is needed for the current listing status of this species. It was recommended that the ABB should remain federally listed as endangered. The ABB was formerly distributed throughout temperate eastern North America and west as far as central Montana (USFWS, 1991). This species' historical range has been reduced, and the ABB is currently distributed in seven states; Arkansas, Kansas, Nebraska, Oklahoma, Rhode Island, South Dakota and Texas (Panella, 2013).

In Nebraska, ABB concentrate in the Loess Canyons and Sandhills (Schneider et al. 2011). The current range in Nebraska includes Cherry, Keya Paha, Boyd, Brown, Rock, Holt, Hooker, Thomas, Blaine, Loup, Garfield, Wheeler, Logan, Custer, Valley, Antelope, and Knox counties in the north central and Lincoln, Dawson, Frontier, and Gosper counties in the south west (Panella, 2013). In South Dakota, ABB has been found in southwest Gregory and southern Tripp counties, approximately 100 miles west of Yankton (South Dakota Game, Fish and Parks [SDGFP], August 29, 1997; SDGFP, 2015).

Biology

The ABB is the largest of the carrion beetles in the U.S. and is a strong flier, which enables this species to travel long distances. ABBs are active from late April through September. This species is nocturnal and is generally active only when nighttime temperatures exceed 60 degrees Fahrenheit (°F) for several consecutive days. The ABB is attracted to carrion in areas that have significant topsoil suitable for burial of carrion, on which it is dependent for food and reproduction. Optimal carrion size has been found to range between 3.5 to 7.0 ounces. The beetles excavate a cavity in the ground and bury the carrion. Eggs are deposited with the food source, and the female remains to care for the young (USFWS, 1991). Successful reproduction does not occur without an adequate food source and appropriate soils.

Habitat Requirements

Although the ABB's habitat is not clearly defined, captures suggest the possibility of riparian woodlands, mixed agricultural lands (including pastures and mowed fields), and grasslands (Ratcliffe and Jameson, 1992). Habitats where ABBs currently occur in Nebraska consist of grassland prairie,

forest edges, open woodlands with grasslands, and scrubland (USFWS, March 2008). Recent research suggests that the ABB is more of a generalist species, using a wider range of habitats than other burying beetles, and that the presence of appropriate soil for carrion burial is more important than habitat type. No strong correlations with soil type or land use have been identified for this species in Nebraska (Bishop et al., 2002); however, adequate soil moisture levels appear critical (Hoback, 2009). Hoback's laboratory and field studies have shown that burying beetles, including ABBs, would seek and use moist soils during periods of inactivity.

Critical Habitat

Critical habitat, as described by the ESA, has not been designated for the ABB.

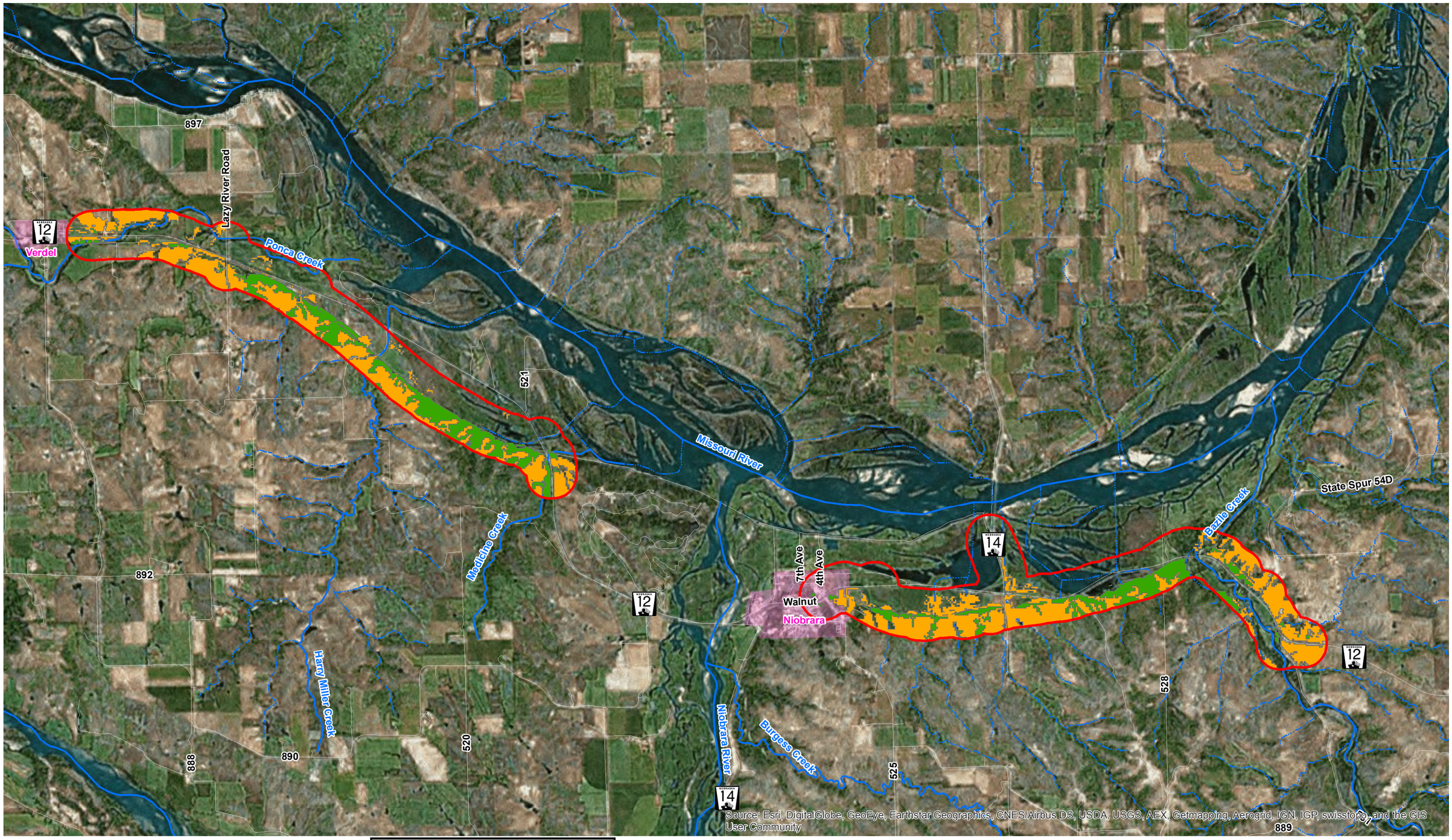
Potential Habitat in the Action Area

The ABB is not currently known to occur within the Action Area; however, potentially suitable habitat may exist. Although the ABB uses a variety of habitats, the north-central Sandhills population of ABB appears to prefer grassland prairie, forest edge, open woodlands with grasslands, and scrubland. The ABB would likely not be found in the deeper-water wetland habitats located adjacent to the Missouri River floodplain because they have never been described as occurring in deeper-water wetland habitats in the literature (USFWS, March 2008). Based on this information, grasslands and woodlands would be more suitable than the wetlands in the floodplain, which are mostly inundated and too wet to provide suitable habitat for this species. All forested and range/pasture/grassland habitats within the Action Area are considered potential ABB habitat. Approximately 1,422 acres of range/pasture/grassland land use (30 percent of total land use) and 639 acres of woodland land type (13 percent of total land use) exists in the Action Area. See Figure 4 for detailed information on potential ABB habitat within the Action Area.

Effects of the Project

Adverse impacts on ABBs would occur primarily from ground disturbance associated with construction during the ABB's inactive and active periods. Construction activities associated with construction of a roadway may disturb soils in areas within the ABB's range.

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\ABB_Habitat_Fig4.mxd



Legend

Action Area

Potential ABB Habitat by Land Cover Type

Range, Pasture, Grass - 1422.15 Acres = 29.8 %

Woodland - 638.59 Acres = 13.4 %

0 0.5 1
Miles

Potential American Burying Beetle (ABB) Habitat

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12 N-12 Niobrara East & West

DATE
October 2015

FIGURE
4

This page intentionally left blank

The ABB is found in a variety of habitats. No strong correlation tying soil type or land use to the ABB's habitat selection has been identified in Nebraskan occurrences of the species; however, adequate soil moisture levels appear to be critical (Hoback, 2009). Although no documented occurrences exist within the Action Area, potential ABB habitat may be disturbed or lost during construction and operation of the N-12 roadway. Most likely, impacts would be due to construction, such as removal and compaction of soils that are important to the ABB's life cycle. Once earth has been compacted and pavement has been laid, the affected soil is unlikely to be suitable habitat for the ABB. Additionally, during earth work, appropriate-sized carrion for the ABB's food and reproduction requirement may also be removed.

To determine impacts on the ABB, woodland and grassland acres were calculated for the project, using the permanent area of impact, because these land use types could contain potential habitat within the Action Area. Direct adverse impacts on ABBs during their inactive and active periods may occur as a result of impacts from 1) clearing vegetation, 2) soil compaction due to heavy equipment operation, 3) grading, 4) soil excavation and filling, and 5) revegetation and reseeding of disturbed areas. Approximately 123 acres of grassland and woodland terrestrial habitat are proposed to be converted to roadway within the Alternative A7 permanent area of impact (see Appendix C, Land Use, in the Draft EIS). Indirect effects may occur from construction activities and related habitat disturbance that may temporarily reduce carrion for ABBs.

ABB surveys are designed to ensure awareness and resolution of any potential conflicts between the ABB lifecycle and potentially disruptive human activities. To avoid conflict, two types of actions are recommended, depending on location: Presence/Absence Surveys, and Capture and Relocation Conservation Measures. In addition, Maintaining Clear Activities, like carcass removal and disposal, and vegetation mowing and removal, may be necessary depending on the situation (USFWS and NGPC, December 2008).

Presence/Absence Surveys are necessary prior to the ABB inactive period in areas impacted by construction, including areas where heavy equipment and materials would be staged and/or stored, all areas within the permanent area of impact, potential haul roads or temporary roads, and borrow sites. Presence/Absence Surveys are not necessary in urban areas dominated by pavement, areas dominated by row crop agriculture, and areas consistently inundated with water. The Nebraska ABB Survey Protocol is recommended, and a Section 10 permit from USFWS and a Scientific and Education Permit from NGPC are required for those conducting surveys (USFWS and NGPC, December 2008).

If ABBs were detected in the area, measures would be implemented to remove ABBs from the Action Area prior to soil disturbance using the Capture and Relocation Conservation Measures. Maintaining Clear Activities measures could be used to prevent ABB from being attracted to the area, like daily carrion inspection and removal, and vegetation mowing in the area (USFWS and NGPC, December 2008).

Currently, no known populations of ABB have been recorded or reported within the Action Area. Due to the limited amount of potentially suitable habitat, due to the current status of the species in the Action Area, and if appropriate conservation conditions are followed, the project may affect, but is not likely to adversely affect, the ABB.

2.2.2 Interior Least Tern

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

The interior population of the least tern (*Sterna antillarum athalassos*) was federally listed as endangered on May 28, 1985 (50 FR 21784-21792). This population was listed as endangered independent of taxonomic status (50 FR 21784-21792). The published range of interior least terns includes the states of Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana (Mississippi River and tributaries north of Baton Rouge), Mississippi (Mississippi River), Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Tennessee, and Texas (except within 50 miles of the coast).

In 1990, USFWS issued a recovery plan for the interior population of the least tern in the aforementioned states (USFWS, September 1990). On April 22, 2008, USFWS initiated a 5-year review of this species (73 FR 21643-21645) and published it October 24, 2013. Interior least terns winter in South America, where little is known about their wintering habits and habitats, and they reproduce in the summer months in North America. Historically, the interior least tern's breeding range extended from Montana to Texas and from southern Indiana to New Mexico, and this breeding range has not changed. This species breeds, nests, and forages along the Missouri, Mississippi, Arkansas, Ohio, Red, and Rio Grande river systems (USFWS, September 1990).

Lott conducted the first range-wide census of the interior least tern in 2005. Lott found that the lower Mississippi River is the most important breeding area for this species, with approximately 62.3 percent of all interior least terns surveyed occurring on the lower Mississippi (Lott, November 2006). Four additional river systems accounted for 33.3 percent of the remaining interior least terns. The overall results of the census are as follows:

- Lower Mississippi River system – 62.3 percent
- Arkansas River system – 11.6 percent
- Red River system – 10.4 percent
- Missouri River system – 6.9 percent
- Platte River system – 4.4 percent

Less than 5 percent of the population was counted on the Ohio River system, the Trinity River system in Texas, the Rio Grande/Pecos River system in New Mexico and Texas, the Wabash River system, two reservoirs in east Texas, and the Kansas River system.

The first historical observation of the interior least tern in Nebraska was recorded by the Lewis and Clark expedition along the Missouri River in 1804. The interior least tern was considered a common breeding species on riverine habitat throughout much of Nebraska before settlement by European Americans. This species was noted to commonly breed along the Missouri, Platte, Elkhorn, lower Loup, and Niobrara rivers (Ducey, 2000; Sharpe et al., 2001). The interior least tern was described as "abundant in June, July and August and breeding in the state," by Taylor and Van Vleet (1888, as cited in NGPC, December 2008). Bruner et al. (1904, as cited in NGPC, December 2008) described this species as "a common migrant and not a rare breeder."

The Platte River, Loup River, Niobrara River, and portions of the Missouri River downstream of both Fort Randall Dam and Gavins Point Dam are river segments in Nebraska that provide naturally occurring sandbar nesting habitat used by interior least terns. Available habitats used by interior least terns for nesting have continued to change through time as human development has encroached on breeding areas and natural ecological changes have occurred (Thompson et al., 1997). Reservoirs, such as Lake McConaughy, sand and gravel pits, and lakeshore housing developments provide an alternative habitat for nesting birds.

Interior least tern populations have been monitored annually by the Corps along the Missouri River since 1986 and along the Niobrara River by NPS since 2003. Continued annual monitoring efforts take place every summer when these birds are breeding and nesting on the rivers. Table 2-2 provides census counts of interior least tern and piping plover adults by year (2003 through 2014) and river segment. All adults, nests, and chicks recorded during the annual censuses were located either upstream or downstream of the Action Area. No interior least tern adults, nests, or chicks have been located by the Corps within the Action Area; however, University of South Dakota graduate students conducting a biological survey of the wetlands within the MNRR documented interior least tern adults foraging in the Action Area.

Overall trends of interior least tern populations fluctuate depending on river flow and available habitat. The Missouri River flood in 2011 impacted the numbers of interior least tern on the Fort Randall segment in 2011; however, the population has rebounded in 2012 through 2014. The Lewis and Clark Lake segment has maintained high population counts of terns since 2008.

Table 2-2. Interior Least Tern and Piping Plover Adult Census Counts

Years Monitored	Missouri River				Niobrara River	
	Fort Randall[1]		Lewis and Clark Lake[1]		River Mile 0-15	
	Interior Least Tern	Piping Plover	Interior Least Tern	Piping Plover	Interior Least Tern	Piping Plover
2003	50	37	46	14	40	24
2004	71	42	13	0	64	36
2005	76	42	4	24	12	9
2006	55	37	0	4	112	54
2007	74	21	85	20	42	23
2008	58	26	225	57	30	31
2009	23	16	214	122	30	40
2010	10	6	272	152	39	30
2011	0	0	231	134	28	13
2012	87	43	211	179	23	10
2013	77	47	148	131	10	1
2014	99	106	131	186	19	1

Note:

[1] The Fort Randall segment of the Missouri River consists of all Missouri River miles downstream of Fort Randall Dam to the confluence with the Niobrara River; the Lewis and Clark Lake segment consists of all Missouri River miles downstream of the confluence with the Niobrara River to Gavins Point Dam.

Sources:

Corps. March 30, 2009. Personal communication between Greg Pavelka, Corps Biologist, and Melissa Marinovich, HDR.

NPS. June 30, 2009. Personal communication between Stephen K. Wilson, NPS Biologist, and Melissa Marinovich, HDR.

Corps. May 4, 2015. Personal communication between Chantel Cook, Corps Tern and Plover Monitoring Program Coordinator, and Meagan Schnoor, HDR.

NPS. May 5, 2015. Personal communication between Lisa Yager, NPS Biologist, and Meagan Schnoor, HDR.

Although no current studies of these species are occurring within the Action Area, several ongoing studies on interior least terns and piping plovers are occurring within the Missouri River in association with the "U.S. Fish and Wildlife Service 2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System" (USFWS, December 16, 2003).

Biology

Least terns (all currently recognized subspecies/populations) are the smallest members of the subfamily Sterninae and family Laridae of the order Charadriiformes. Adults measure approximately 8 to 9.5 inches long, with a 20-inch wingspan. The birds have a black cap, a white forehead, grayish back and dorsal wing surfaces, and a dark-tipped bill (Thompson et al., 1997).

The interior least tern is a migratory species, breeding along large rivers within the interior of the U.S. Interior least terns typically begin arriving in Nebraska in early May to mid-June and spend approximately 4 to 5 months at their breeding sites (Faanes, 1983, as cited in USFWS, 1988; USFWS, September 1990). Interior least terns nest in shallow depressions with small stones, twigs, or other debris nearby. Interior least terns nest in colonies, or terneries, and nests can be as close as just a few feet apart or widely scattered up to hundreds of feet. Nesting interior least terns appear tolerant of vehicular and railroad traffic, but abandon nests and colonies if directly disturbed by pedestrians, off-road vehicles, pets, and livestock (Carreker, 1985). Egg-laying typically begins in late May, with the female laying one to three eggs in a nest (Thompson et al., 1997; USFWS, September 1990; Szell and Woodrey, 2003). Incubation typically lasts 17 to 28 days (Thompson et al., 1997; USFWS, September 1990). Interior least tern chicks are able to walk upon hatching but are brooded for approximately 1 week and fledged after 3 weeks, although parental care continues until fall migration (USFWS, September 1990). Departure from colonies by both adults and fledglings varies but is usually complete by early September.

The interior least tern is piscivorous (consuming fish), feeding in shallow waters of rivers, streams, and lakes. Some of the most important fishes in their diet include the following: topminnows (*Fundulus* spp.), shiners (*Notropis* spp.), stonerollers (*Campostoma* spp.), minnows (*Pimephales* spp.), mosquitofish (*Gambusia* spp.), bass (*Morone* spp.), shad (*Dorosoma* spp.), sunfish (*Lepomis* spp.), and carpsuckers (*Carpiodes* spp.) (Mitchell, 1998). Schweitzer and Leslie (1996) found interior least terns on Oklahoma salt flats consumed red shiner (*Notropis lutrensis*), common carp (*Cyprinus carpio*), plains minnow (*Hybognathus placitus*), and channel catfish (*Ictalurus punctatus*). Although fish is the basic dietary item, invertebrates have been occasionally consumed by interior least tern adults and chicks. Wilson et al. (1993) documented adult interior least terns capturing

flying insects and occasionally picking crawling insects from the sand at sandpits near the Platte River in Nebraska.

Prey size is an important aspect of the interior least tern diet. Body length of fish caught by adult interior least terns ranges from 1 to 3.5 inches (2.5 to 9.0 centimeters) (Schweitzer and Leslie, 1996). Adult interior least terns usually consume fishes longer than 1.6 inches (4 centimeters) and bring smaller fish to the nest for the chicks (Mitchell, 1998). Schweitzer and Leslie (1996) found that chicks on Oklahoma salt flats accepted fish from 0.5 to 1.0 inch (1.3 to 2.6 centimeters) in length. Chicks on central Nebraska sandpits were documented eating cyprinids up to 1.5 inches (3.8 centimeters) long (Wilson et al., 1993).

Terns, in general, dive into standing or flowing water to capture prey and have a maximum diving depth of less than 3 feet (1 meter) (Salt and Willard, 1971, and Eriksson, 1985, both as cited in Schweitzer and Leslie, 1996). Interior least terns are categorized as surface plungers (Mitchell, 1998) because they search for prey while flying or hovering 16 to 33 feet (5 to 10 meters) above the surface of the water and plunge into the water to capture detected prey (Mitchell, 1998). Atwood and Kelly (1984) observed interior least terns catching prey just below the surface of the water and either eating the fish while flying or carrying it back to the nest to feed their mate and chicks.

Habitat Requirements

Meandering rivers with broad flat floodplains, high sedimentation rates, and slow currents resulting in the formation of sandbars and shallow water areas offer the most suitable habitat for nesting and feeding (Whitman, 1988, as cited in Lott, November 2006). Typical riverine nesting habitat for interior least terns is unvegetated or sparsely vegetated sand and gravel bars with a wide unobstructed river channel (USFWS, September 1990).

An important factor for nest site selection of interior least terns is continuous exposure of the site above water for at least 100 days during the nesting period from mid-May to early August (Smith and Renken, 1993). Sandbar habitats used by interior least terns are ephemeral (Kirsch, 1996; Thompson et al., 1997); thus, interior least tern nests are susceptible to loss of nests, eggs, or chicks caused by high water events. Nesting is usually initiated during high-flow periods, causing interior least terns to nest on higher areas of sandbars.

Another important factor for nesting habitat for interior least terns is lack of vegetation at the nest site. Suitable nesting areas often contain little vegetation (less than 25 percent) (Ziewitz et al., 1992), and the vegetation that is present is typically less than 3.9 inches (10 centimeters) tall (Dirks et al., 1993). Wilson et al. (1993) and Dirks et al. (1993) found that nesting interior least terns on sand pits preferred areas of less than 10 percent vegetative cover. Average distance from the nest to the nearest plant was approximately 7.9 inches (20.1 centimeters), and average height of the nearest plant was 5.1 inches (13.0 centimeters). Smith and Renken (1993) found that a common feature of nesting habitat was the presence of large amounts of sticks, twigs, and bark (driftwood) deposited by receding river levels near nesting colonies. It is hypothesized that this debris is used by chicks as shelter from predators. Dirks et al. (1993) documented interior least terns nesting within 3 feet (1 meter) of an object almost 90 percent of the time. In that study, interior least tern nests were initiated most often near driftwood (53 percent) and organic debris (37 percent).

Also important to the nesting habitat and reproductive success of these birds is proximity to foraging areas (Dugger, 1997). Because the interior least tern forages on small fish, it is likely that nesting sites would be near areas with an abundance of fish; however, interior least terns would forage

some distance away from nesting sites. Faanes (1983, as cited in USFWS, 1988) observed interior least terns foraging within 328 feet (100 meters) of the colony. Wilson et al. (1993) observed interior least terns nesting on sand pits in central Nebraska; during the period of the study, the birds foraged at both the sand pit lakes and in the Platte River at greater than 0.9 mile (1.5 kilometers) from the colony. Smith and Renken (1990) observed interior least terns on sand and gravel mining sites in Oklahoma and found the birds may fly up to 2 miles (3.2 kilometers) to forage at riverine sites. Radio telemetry work conducted on the Missouri River by the Northern Prairie Wildlife Research Center of the U.S. Geological Survey (USGS) suggests that interior least terns may be moving farther from the colony for foraging than previously published. Evidence suggests that interior least terns forage most efficiently in areas with shallow water because these areas have a higher density of small fish species as compared to deep water habitats (Tibbs and Galat, 1997).

Nesting sites on river sandbars are often found within relatively wide channels with a large area of dry, sparsely vegetated sand (Kirsch, 1996). Nest sites in the lower Platte River had an average of 3.58 acres of dry, sparsely vegetated sand when many nests were initiated (Ziewitz et al., 1992). Ziewitz et al. (1992) also found that birds nested in areas where the channel was wider with a greater area of sandbars. That study recommended that sandbars be at least 3.58 acres in size and be 2.99 feet above river level for maximum flooding protection and at a minimum 1.48 feet in height. In a preliminary study, Brown and Jorgensen (2008) looked at river nesting habitat used by interior least terns in the lower Platte River in Nebraska. They found that the average sandbar area used was 12.18 acres. The average elevation of sandbars selected by interior least terns for nesting was 2.29 feet above the surface of the water.

Critical Habitat

Critical habitat, as described by the ESA, has not been designated for the interior least tern.

Potential Habitat in the Action Area

No suitable nesting habitat exists within the Action Area for this species; however, suitable foraging habitat does exist within the semi-permanently flooded wetlands in the Missouri River floodplain. Interior least terns have been documented foraging in the floodplain wetlands in the Action Area.

Effects of the Project

Although interior least terns may use the Missouri River corridor and the Niobrara River during migration and breeding seasons, the Missouri River wetlands in the Action Area, while connected to the river hydrologically, do not contain suitable breeding or nesting habitat for this species. The project would impact approximately 91 acres of wetlands and open waters within Alternative A7's permanent area of impact. Because interior least terns may forage long distances from their nests for minnows and other small fish, the amount of impact is considered insignificant and discountable. These impacts would occur on less than 2 percent of the total wetland habitat, both within the Action Area and downstream to the Lewis and Clark Lake delta area of the floodplain. Thousands of acres of additional habitat are available within the interior least tern's range. The project may affect, but is not likely to adversely affect, interior least terns.

2.2.3 Piping Plover

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

The piping plover (*Charadrius melodus*) has been afforded two separate federal protection statuses based on location of population. On December 11, 1985, this species was federally listed as endangered throughout the Great Lakes region and federally listed as threatened throughout the rest of the species range (50 FR 50726-50734). The published range of the Great Lakes population includes the Great Lakes Watershed region; the states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin; and the Province of Ontario, Canada. The published range of the remaining populations (Atlantic and Northern Great Plains) is along rivers, lakes, and wetlands in the following U.S. states and territories: Alabama, Colorado, Connecticut, Delaware, Florida, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Texas, Virginia, and Wisconsin. In 1988, USFWS issued a recovery plan for the Great Lakes and Northern Great Plains population of the piping plover. On May 2, 1996, USFWS published a revised recovery plan for the Atlantic Coast population of piping plover. On September 16, 2003, USFWS published a final recovery plan for the Great Lakes population. A revised recovery plan has not yet been issued for the Northern Great Plains population; the effort began in 2010.

On July 8, 2014, USFWS initiated a 5-year review of this species (79 FR 38560-38562). The Northern Great Plains population has the potential to occur in the Action Area.

Piping plovers winter along the southern Atlantic coast in the U.S., the Gulf of Mexico coast in the U.S. and Mexico, and the Caribbean islands. Only 40.2 percent of the known breeding population has been observed on wintering grounds, so it is evident that there are other wintering locations that have not yet been determined (Ferland and Haig, 2002). Piping plovers reproduce in the summer months in the northern U.S. and Canada. The piping plover breeding range includes 1) the Northern Great Plains from Alberta to Manitoba and south to Nebraska, 2) the Great Lakes beaches, and 3) Atlantic coastal beaches from Newfoundland to North Carolina.

Piping plovers are relatively short-distance migrants that spend up to 70 percent of their annual cycle on wintering areas. During the nonbreeding period (approximately early September to early April), piping plovers use beaches, sandflats, and dunes along the Gulf of Mexico coastal beaches, adjacent off-shore islands (Haig and Oring, 1985), and the southern Atlantic coast (Nicholls and Baldassarre, 1990). Spoil piles in the Intercoastal Waterway are also used.

In Nebraska, piping plovers nest along the Loup, Platte, Niobrara, Elkhorn, and Missouri rivers. Piping plover populations have been monitored annually by the Corps along the Missouri River since 1986 and along the Niobrara River by NPS since 2003. Continued annual monitoring efforts take place every summer when these birds are breeding and nesting on the rivers. In Section 2.2.2.1, Table 2-2 provides census counts of interior least tern and piping plover adults by year (2003 through 2014) and river segment. All adults, nests, and chicks recorded during the annual censuses were located either upstream or downstream of the Action Area. No piping plover adults, nests, or chicks have been located within the Action Area.

Overall trends of piping plover populations fluctuate depending on river flow and available habitat. The Missouri River flood in 2011 impacted the numbers of interior least tern on the Fort Randall segment in 2011; however, the population has rebounded in 2012 through 2014. The Lewis and Clark Lake segment has maintained high population counts of plovers since 2008.

Biology

The piping plover is a small migratory shorebird with a short, stout bill, pale underparts, and orange legs. Both sexes are sand colored. During the breeding season, adults acquire single black forehead and breast bands, and orange bills (USFWS, 1988).

The piping plover is a migratory species, breeding along large rivers within the interior of the U.S. and Canada, and along the Atlantic coast. Piping plovers typically begin arriving in Nebraska in late April and early May and spend approximately 3 to 4 months at their breeding sites (Sharpe et al., 2001). Once the birds arrive, the males begin establishing territories with aerial displays and calls (Aron, 2005).

Piping plover nests are shallow depressions frequently lined with small pebbles or shell fragments (Cairns, 1982; USFWS, 1988). Egg-laying typically begins in mid-May, with females usually laying three to five eggs (Aron, 2005). Incubation lasts approximately 28 days (Wilcox, April 1959; Cairns, 1982; Haig and Oring, 1988a, as cited in NGPC, December 2008). Piping plover chicks are precocial, leaving the nest almost immediately. The chicks begin foraging and feeding themselves within a few hours of hatching and leaving the nest (Cairns, 1982). Fledging typically occurs approximately 28 days after hatching. Departure from nesting areas by both adults and fledglings varies but is usually complete by early August (Cairns, 1982; Prindiville Gaines and Ryan, 1988).

Piping plovers forage visually for invertebrates in shallow water and associated moist substrates (Cuthbert et al., 1999; Whyte, 1985, as cited in NGPC, December 2008). Piping plovers primarily feed on beetles and small soft-bodied invertebrates from the waterline. In addition, they opportunistically take prey from drier sites at sand pits (Lingle, 1988, as cited in NGPC, December 2008).

Habitat Requirements

Piping plovers nest on open to sparsely vegetated sand and gravel beaches along the Atlantic coast, the Great Lakes, and throughout the Great Plains of North America (Cairns, 1982; Prindiville Gaines and Ryan, 1988; Haig and Elliot-Smith, 2004). Piping plovers nesting on the Missouri, Platte, Niobrara, Yellowstone, and other Great Plains rivers use beaches and dry, barren sandbars in wide, open channel beds (Kirsch, 1996; USFWS, 1988). Suitable nesting areas often contain minimal vegetative cover of less than 25 percent (Ziewitz et al., 1992). The optimum range for vegetative cover on nesting habitat has been estimated at 0 to 10 percent (Armbruster, 1986, as cited in NGPC, December 2008). Piping plovers often express a strong preference for nests to be initiated near objects, such as driftwood, stones, or plant debris (Haig, 1992).

Sandbar area and height are important factors in nesting habitat selection. Faanes (1983, as cited in USFWS, 1988) studied Platte River sandbars occupied by nesting piping plovers and found that the sandbars with active nests averaged approximately 3.89 acres. Piping plover nests averaged 52 feet from the water's edge, with the average height above the river level measuring 0.66 foot (it should be noted that all nests studied were inundated by rain events). Ziewitz et al. (1992) found similar results with nest site sandbars on the lower Platte River averaging 3.58 acres. Nests on the

central Platte River were initiated at lower elevations (an average of 1.28 feet) than nests on the lower Platte River (1.61 feet) (Ziewitz et al., 1992).

Along with interior least terns, piping plovers would use man-made habitats such as sand and gravel mine pits and lakeshore housing developments. These sandy lake shores provide a barren to sparsely vegetated substrate suitable for nesting habitat (Sidle, 1993).

Critical Habitat

There is currently no federally designated critical habitat for piping plover within the State of Nebraska or in the Action Area.

Potential Habitat in the Action Area

No bare sand or gravel areas exist within the Action Area to provide nesting or foraging habitat for this species. The piping plover is not currently known to occur within the Action Area, and no suitable habitat for this species exists within the Action Area.

Effects of the Project

The Action Area does not contain suitable breeding or foraging habitat for piping plovers. No exposed sand or gravel areas are located within the Action Area to provide breeding habitat for this species. In addition, the wetlands located within the Action Area are consistently inundated and do not provide adequate shallow water on sand and gravel substrates for foraging piping plovers. This species is not known to occur in the Action Area; therefore, the project would have no effect on piping plovers.

2.2.4 Rufa Red Knot

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

The rufa red knot (*Calidris canutus rufa*) is a shorebird that was federally designated as threatened on December 9, 2014 (50 CFR 17). The rufa red knot migrates annually between its breeding grounds in the Canadian arctic and its wintering regions in the southeast United States, northeast Gulf of Mexico, northern Brazil and the Tierra del Fuego in South America. Rufa red knots use staging and stopover areas in the continental United States and Canada in its spring and fall migrations (50 CFR 17). The population size is now in the low 10,000s; overharvest and population declines of horseshoe crabs are probably the reasons for their decline (NatureServe, 2015).

Biology

The rufa red knot is approximately the size of an American robin. They are 9 inches long and have a 20 inch wingspan. In the spring, the birds are mottled gray, black and ochre with cinnamon brown breasts and in winter they become pale ashy gray with speckled breasts (USFWS, 2015b). The rufa red knot is a subspecies that is found in the Western hemisphere. Rufa red knots primarily eat small clams, mussels, snails and other invertebrates (USFWS, 2013).

The rufa red knot winters at the tip of South America, in northern Brazil, throughout the Caribbean, and along the U.S. coast from Texas to North Carolina. Red knots winter and migrate in large flocks

containing hundreds of birds. These flocks may fly more than 9,300 miles from the wintering ground to the breeding grounds in the tundra of the central Canadian Arctic from northern Hudson Bay to the southern Queen Elizabeth Islands. Migrating rufa red knots can complete nonstop flights of 1,500 miles, so the stopover areas must provide critical rest and quality prey, such as juvenile clams and mussels and horseshoe crab eggs. During flight, red knots have enlarged flight muscles, decreased stomachs and gizzards and increase fat masses. They can arrive at stopovers very thin, and sometimes emaciated. At the stopovers they add up to 10 percent of their body weight each day by constantly eating (USFWS, 2013).

Habitat Requirements

Rufa red knots depend on suitable habitat, food and weather conditions at their wintering sites, their breeding grounds and their migratory stopovers. Migratory stopovers are typically coastal zones that contain sandflats or mudflats. The species also frequents peat-rich banks, salt marshes, brackish lagoons, mangrove areas, and mussel beds. In these areas, the birds feed on mollusks, crustaceans and other invertebrates (Government of Canada 2015). USFWS has records of rufa red knot occurring in Knox County and the bird is protected wherever found (USFWS 2015c).

Critical Habitat

There is no critical habitat designated for rufa red knot.

Potential Habitat in the Action Area

Any sandbars or sandy shores along the Missouri River would provide adequate habitat. No bare sand or gravel areas exist within the Action Area.

Effects of the Project

Alternative A7 would have no effect on the rufa red knot because no suitable foraging habitat exists for this species within the Action Area.

2.2.5 Whooping Crane

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

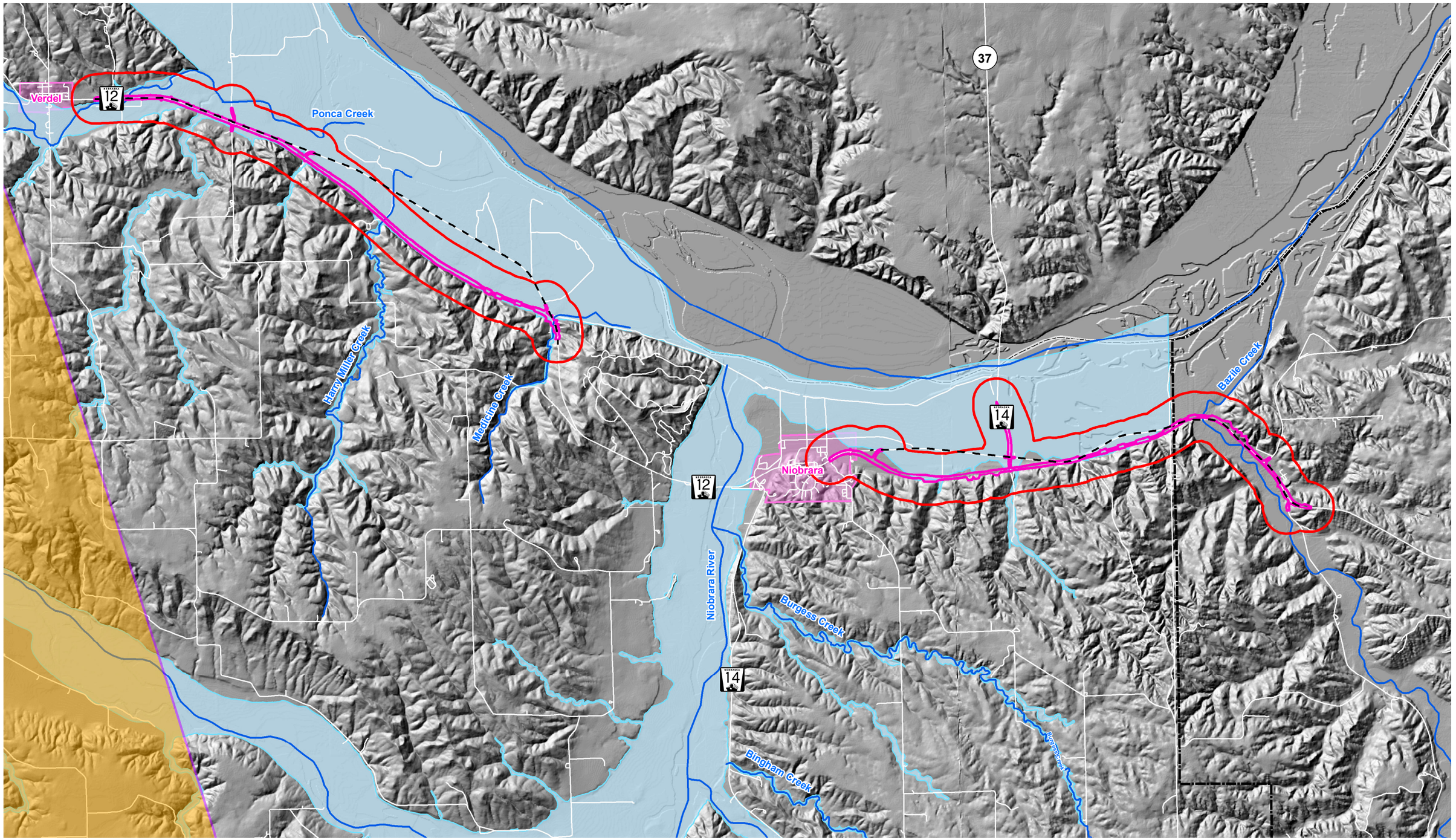
The whooping crane (*Grus americana*) was federally listed as endangered on March 11, 1967 (32 FR 4001). A revised recovery plan was finalized for this species on May 29, 2007 (72 FR 29544). On March 29, 2010, USFWS initiated a 5-year review of this species (75 FR 15454-15456). The review is ongoing, and no results have been published to date. Whooping cranes occur throughout North America, and the total wild population is estimated at 343 birds in 2011 (Stehn, August 30, 2011). This estimate includes birds in the only self-sustaining Aransas-Wood Buffalo National Park population that winters in coastal marshes in Texas and migrates through Nebraska on its way to Canada to nest in the Wood Buffalo National Park and adjacent areas, as well as captive-raised birds that have been released in Florida and a migratory population between Florida and Wisconsin. Currently, the Aransas-Wood Buffalo flock population is estimated at 278 birds (Stehn, August 30, 2011). Overall, whooping crane population trends throughout the range appear to be experiencing a gradual positive trend.

Most wild whooping cranes migrate from Wood Buffalo National Park in Canada to Aransas National Wildlife Refuge on the Texas coast. This route passes southeast through northeastern Alberta, south-central Saskatchewan, northeastern Montana, western North Dakota, western South Dakota, central Nebraska and Kansas, west-central Oklahoma, and east-central Texas. Scattered occurrences have been reported in adjacent states and provinces (Canadian Wildlife Service and USFWS, March 2007).

The migration path of the Aransas-Wood Buffalo flock that nests in northern Canada and migrates to the Gulf of Mexico passes through central Nebraska, mainly in the Platte River basin. Whooping cranes can be found in Nebraska as they migrate through the state between early October and late November in the fall and mid-March to late May in the spring (Austin and Richert, 2001). Knox County is on the eastern edge of the main whooping crane migration corridor (see Figure 5, Whooping Crane Migration Corridor in Nebraska). No sightings have been confirmed within the designated MNRR, but a single whooping crane has been sighted in Knox County along Bazile Creek south of the Action Area, which is fairly unusual because it is east of the central flyway (USFWS, April 15, 2009). No studies for this species are currently being conducted within the Action Area.

This page intentionally left blank

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Whooping_Crane_Migration_Corridor_Fig_5.mxd



Legend

- Existing Alignment
- Alternative A7 LOC
- Whooping Crane Migration Corridor
- Roads
- Waterway
- 100-Year FEMA Floodplain
- Santee Sioux Nation
- Action Area
- County Line
- City Limit

0 0.5 1 Miles

Whooping Crane Migration Corridor in Nebraska

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12 N-12 Niobrara East & West

DATE
October 2015

FIGURE
5

This page intentionally left blank

Biology

Whooping cranes use a variety of habitats for breeding, migrating, wintering, and foraging throughout the U.S. and Canada. Habitats include coastal marshes and estuaries, inland marshes, ponds, lakes, wet meadows, rivers, and agricultural fields. This species breeds and nests in the wetland habitat in Wood Buffalo National Park in Canada. Whooping cranes are monogamous, forming pairs and laying eggs as early as 3 years of age. Fidelity to breeding areas is documented, and this species normally nests in the same vicinity each year. Eggs are typically laid between late April to mid-May, and incubation lasts approximately 30 days. Whooping cranes typically produce clutches of two eggs and share incubation and brood-rearing duties (USFWS, September 27, 2011). The whooping crane is a biannual migrant, traveling in the spring and fall of each year across the Great Plains of the central U.S. between summer habitat in central Canada and wintering grounds in Texas. The migration corridor is approximately 2,400 miles long and 220 miles wide. This corridor encompasses 95 percent of known sightings of whooping cranes, although occasionally this species may be sighted outside the main corridor. This species stops daily during migration to feed and rest, unless local weather conditions dictate otherwise. Whooping cranes are omnivorous, mainly feeding on insects, frogs, rodents, small birds, minnows, berries, blue crabs, clams, snails, crayfish, and agricultural grains (USFWS, September 27, 2011).

Habitat Requirements

A variety of habitats are used during migration, such as croplands and wetlands for feeding and shallow areas in rivers, lakes, and streams for roost sites (Austin and Richert, 2001). Overnight roosting requires shallow water over submerged sandbars on which the cranes stand and rest. This species has shown a preference for unobstructed channels that are isolated from human disturbance (Armbruster, 1990, as cited in Canadian Wildlife Service and USFWS, March 2007). Large palustrine wetlands are used for roosting and feeding during migration.

Critical Habitat

The critical habitat for this species is located along a 56-mile-long, 3-mile-wide stretch of the Platte River between Lexington and Shelton, Nebraska (Canadian Wildlife Service and USFWS, March 2007) (see Figure 5, above). This area is approximately 150 miles southwest of the Action Area. There is no critical habitat designated for this species within the Action Area.

Potential Habitat in the Action Area

The wetlands that exist along the Missouri and Niobrara river floodplains and along Bazile Creek could be used for foraging by whooping cranes. These wetlands provide habitat for small fish, insects, and amphibians that whooping cranes use for forage. Use of this area would be migratory in nature. No submerged sandbars, which would provide roosting habitat, exist within the Action Area.

Effects of the Project

Whooping cranes may use the Missouri River corridor, associated tributaries, and the Niobrara River during migration for foraging. The Action Area is located on the eastern edge of the main migration corridor used by this species. Because of this, the potential is low for migrating whooping cranes to rely on the Action Area as their primary foraging site. Alternative A7 would impact approximately 91 acres of wetlands and open waters within the permanent area of impact. However, the impact on

wetlands and open water is not likely to adversely affect this species. The wetland impacts would affect approximately 1 percent of the total wetland habitat within the Missouri River floodplain in the Action Area and downstream to the Lewis and Clark Lake delta. Thousands of acres of additional foraging habitat are available within the whooping crane's range. Based on the rarity of sightings and the relative location of the project to the main migration corridor within the Action Area, the project may affect, but is not likely to adversely affect, the whooping crane.

2.2.6 Pallid Sturgeon

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

The pallid sturgeon (*Scaphirhynchus albus*) was federally listed as endangered on September 6, 1990 (55 FR 36641-36647). The published range of this species includes the states of Arkansas, Illinois, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Tennessee. In 1993, USFWS issued a recovery plan for the pallid sturgeon. The recovery plan outlines species recovery objectives and criteria, and divides the species' range into six Recovery-Priority Management Areas (RPMAs). These areas were identified as having recent pallid sturgeon records of occurrence, with the least degradation, highest habitat diversity, and the greatest potential for pallid sturgeon to successfully return to the areas near their pre-settlement conditions (Aron, 2006). On July 7, 2005, USFWS initiated a 5-year review of this species (70 FR 39326-39327); this review was completed and published on June 13, 2007. The results of this recent review recommended that no change is needed for the current listing status of the pallid sturgeon. It was recommended that the pallid sturgeon remain federally listed as endangered.

The pallid sturgeon was not described as a species until 1905 (Forbes and Richardson, 1905, as cited in USFWS, 1993). Prior to 1905, the pallid sturgeon was considered a different color morph of the shovelnose sturgeon. The relatively late recognition of the pallid sturgeon as a distinct species may have resulted from its scarcity. Pallid sturgeon have a flattened, shovel-shaped snout; long, slender, and completely armored caudal peduncle (narrow part of body to which tail fin is attached); and lack a spiracle (small respiratory hole behind the eye of certain fishes). The mouth of the sturgeon is toothless, protusible, and ventrally positioned under the snout. Skeletal structure is primarily cartilaginous. Pallid sturgeon are similar in appearance to the more common shovelnose sturgeon. Principal features distinguishing pallid sturgeon from shovelnose sturgeon are the number of ribs (21 to 22 in pallid and 10 or 11 in shovelnose), the naked breast and belly in pallid sturgeon and the presence of sub-rhombic plates on the shovelnose sturgeon, and the length of the air bladder to standard length (8 times in pallid and 5 times in shovelnose) (Forbes and Richardson, 1905, as cited in USFWS, 1993).

The pallid sturgeon is rare but widely distributed throughout the Missouri and Mississippi rivers and the lower reaches of associated tributaries. The total length of the species' range is approximately 3,515 miles (5,656 kilometers) of river. States within this species' range include Arkansas, Illinois, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Tennessee (USFWS, 1993). The earliest record recognized by Bailey and Cross (1954) was referred to by Cope (1879) as a shovelnose sturgeon. For most of the time since the pallid sturgeon was first described in 1905, fisherman and fisheries biologists did not readily distinguish between shovelnose and pallid sturgeon in their catches (Keenlyne, 1989, as cited in

Peters and Parham, 2008a). Today, historical references to very large individuals (greater than 5 kilograms) of *Scaphirhynchus* spp. are considered to be pallid sturgeon (Bailey and Cross, 1954, as cited in Peters and Parham, 2008a).

Figure 6 displays a map of the pallid sturgeon range, including the six RPMAs. RPMA 3 includes the Missouri River from 20 miles upstream of the mouth of the Niobrara River to Lewis and Clark Lake.

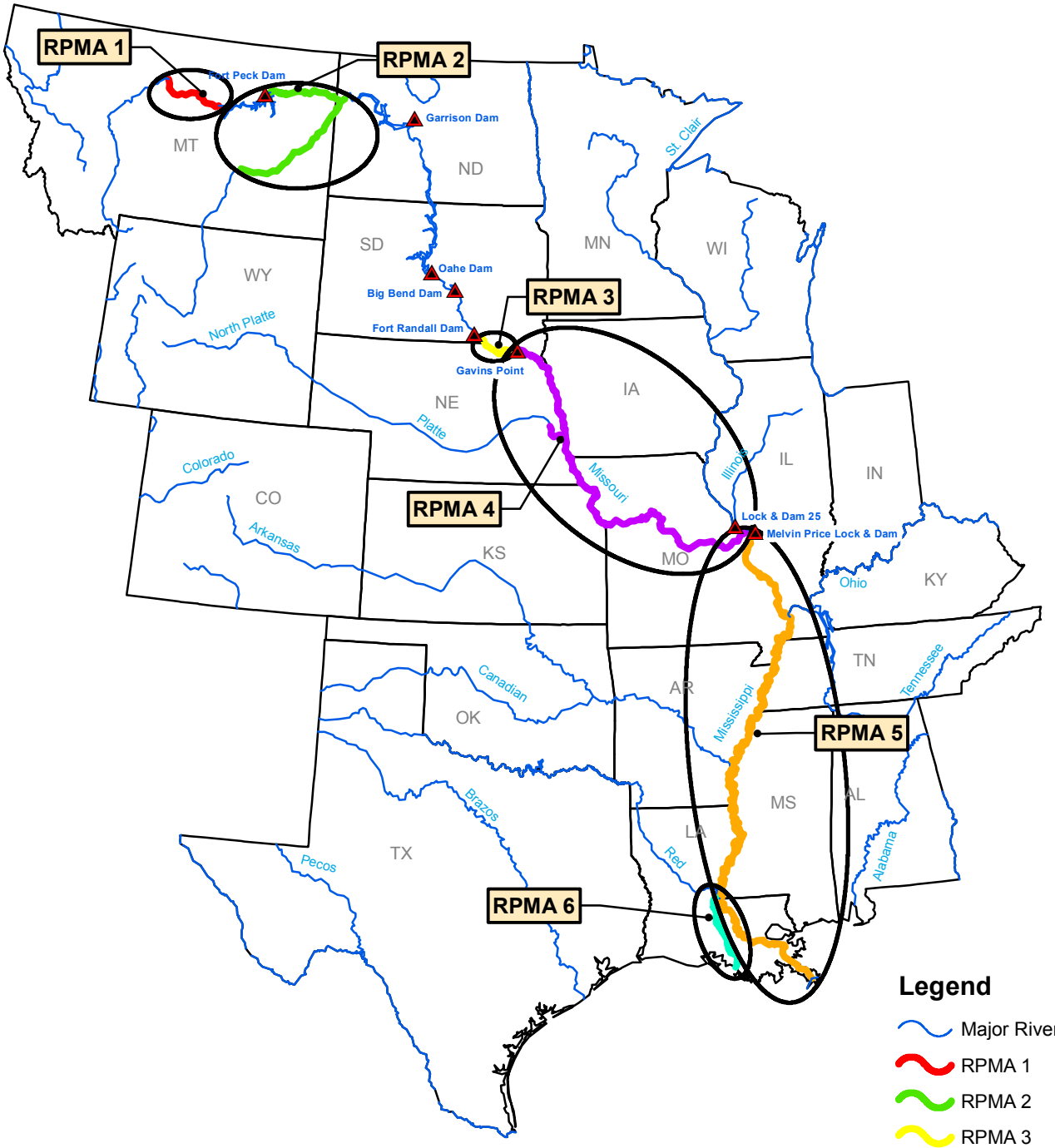
The Missouri River and a few of its turbid tributaries were probably the core of the pallid sturgeon range (Bailey and Allum, 1962; Bailey and Cross, 1954, as cited in Peters and Parham, 2008a). The entire Missouri River, from the mouth upstream to Great Falls, Montana, was available to pallid sturgeon prior to dam construction, which began in the 1930s, and channelization of the Missouri River from Sioux City, Iowa, to the confluence with the Mississippi River. Today, much of the length from Fort Peck reservoir downstream to Gavins Point dam is a lacustrine environment with short reaches of flowing water habitat. Pallid sturgeon were still caught in the reservoirs for several decades after impoundment (Peters and Parham, 2008a), but today most of the specimens caught are senescing or nearing their maximum age (USFWS, June 13, 2007).

The upper Missouri River is composed of RPMAs 1, 2, and 3. RPMA 3 is an isolated section of habitat between Fort Randall dam and Lewis and Clark reservoir, and includes the 39-Mile District of the MNRR. This reach receives water from the Niobrara River. Although this reach had habitat that originally supported wild pallid sturgeon, today this section of the Missouri River and the lower portion of the Niobrara River contain only a stocked population of pallid sturgeon (Wanner et al., 2007b).

Species of sturgeon across the globe are threatened by changes to riverine habitat and overfishing. Pallid sturgeon populations are extremely susceptible to threats because this species has never historically been as abundant as its more common counterpart, the shovelnose sturgeon. When the species was first described in 1905 (Forbes and Richardson, 1905, as cited in USFWS, 1993), it represented approximately one in five sturgeon in the lower Missouri River. Carlson et al. (1985) conducted a study on the Missouri and Mississippi rivers and found 1 pallid sturgeon in 647 sturgeon caught. In 1994, the ratio in the lower Missouri River was 1 pallid sturgeon to 341 shovelnose sturgeon (Doyle et al., 2005, as cited in Aron, 2006). There has also been an apparent increase in hybridization between pallid and shovelnose sturgeon in recent years (Grady et al., 2001). Researchers are concerned about the threat that hybridization poses to the genetics of the pallid sturgeon (Simons et al., 2001).

Dam construction on the Missouri River has adversely impacted pallid sturgeon both by impeding their movement to spawning areas and by changing the flow and temperature regime, amounting to less suitable habitat along several parts of their historic range (Bailey and Cross, 1954; Keenlyne, 1989, as cited in Aron, 2006). Little evidence has been found of spawning across the species' range; however, some evidence to support spawning activity was found by several studies done on the lower Missouri River and Platte River (Peters and Parham, 2008b; Swigle, 2003; USGS, 2007). Larval fish released from Garrison Dam National Fish Hatchery in Montana during 2004 were recaptured in 2005, evidencing that short-term fry survival is occurring (Aron, 2006). Juvenile recaptures of stocked populations have been increasing across the species' range, evidencing that stocked Juveniles are surviving and maturing.

This page intentionally left blank



Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Pallid_Sturgeon_Recovery_Prority_Areas_Fig_6.mxd

0 125 250
Miles

Pallid Sturgeon Recovery Priority Areas

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12 N-12 Niobrara East & West

DATE
October 2015

FIGURE
6

This page intentionally left blank

Life Cycle Stages

Pallid sturgeon embryos are dependent on the yolk of their eggs as a vital food resource for development. Prior to hatching, the embryos adhere to the substrate where the eggs were deposited during spawning (Korschgen, 2007). Post-hatching, the embryos drift downstream with water currents (Kynard et al., 2002; Kynard et al., 2007). This period of drifting may carry the embryos over 186.4 miles (300 kilometers) downstream of the point of hatching (Kynard et al., 2007). During the embryonic drift phase, the embryos are at risk of being preyed on by planktivorous fishes (Braaten et al., 2009).

When the sturgeon begin to develop fin rays and the egg yolk has been used, they also begin to transition into exogenous (outside of the body) feeding (Snyder, 2002). This change defines the transition from the embryonic stage to the larval stage. This stage marks the juncture when larval pallid sturgeon begin competing with other fish larvae for available food resources. During this transition, larval pallid sturgeon gain mobility to actively seek out habitats to avoid the current and to feed. Pallid sturgeon are considered larvae until they lose their fin folds, develop a complete set of caudal fin rays, and reach approximately 8 inches in length (Peters and Parham, 2008a).

Pallid sturgeon are considered juveniles until their gonads develop. Younger juveniles consume primarily macroinvertebrates, while older juvenile pallid sturgeon are piscivorous (Gerrity et al., 2006).

Pallid sturgeon are considered adults when they sexually mature. Gonadal development takes several years for pallid sturgeon, increasing the length of time for an individual fish to become a reproductive member of the population. Males may mature at age 10, and females may not become sexually mature until they reach the age of 15 (Keenlyne and Jenkins, 1993). Females may spawn only every 3 to 4 years (USGS, 2007; Wildhaber et al., 2007).

Biology

All sturgeon spawn in freshwater and scatter their eggs over coarse gravel or rocky substrates in shallow areas of rivers (Wildhaber et al., 2007). Pallid sturgeon have been found to have mature gametes during seasons coinciding with natural high river flows (Keenlyne and Jenkins, 1993) and to likely spawn as early as April in the lower portion of their range and as late as June in the northern portion. Difficulties have arisen in studying spawning habits of pallid sturgeon as a result of the turbid water conditions in large rivers inhabited by this species. Studies of spawning readiness have allowed researchers to select individuals that are ready to spawn and track their movements using telemetry tools (USGS, 2007). The spawning cue is likely primarily driven by high spring flows. A number of factors are tied to high flows, including temperature, turbidity, depth, velocity, and changes in water chemistry.

There have been no direct observations of natural reproduction of pallid sturgeon (Peters and Parham, 2008a). DeLonay et al. (USGS, 2007) was able to track radio-tagged shovelnose sturgeon as they moved upstream, spawned, and moved downstream. Simpkins and LaBay (USGS, 2007) used egg mats in the Missouri River to collect sturgeon eggs from locations where reproductively mature shovelnose sturgeon were tracked using radio telemetry.

All known sturgeon spawning areas occur in freshwater rivers and streams over gravel and rock substrates. This information has been used to draw conclusions about where pallid sturgeon might spawn (Laustrup et al., 2007; USGS, 2007; Wildhaber et al., 2007). Knowledge of where pallid

sturgeon spawn is limited by this species' low population density and the 3- to 4-year time interval between spawning events by an individual female (Peters and Parham, 2008a).

Pallid sturgeon have been documented making long-distance movements during their life history (USGS, 2007; Wildhaber et al., 2007; Peters and Parham, 2008a; Steffensen, April 2009). During the free-embryo and larval life stages, pallid sturgeon drift with the current, and juvenile individuals have been tracked moving downstream (Kynard et al., 2007). Peters and Parham (2008a) stated that there have been no definitive relationships drawn between pallid sturgeon movements and spawning activities; however, studies done by USGS (2007) and Wildhaber et al. (2007) noted that shovelnose sturgeon (often used as a pallid sturgeon surrogate) have exhibited spawning migrations when they are physiologically ready to spawn.

Food habits of this species range from aquatic invertebrates to fish, depending on life stage (Gerrity et al., 2006; Peters and Parham, 2008a). Morphology studies of the mouth of pallid sturgeon reveal that they have the capability to protrude their mouth toward their prey and close it before retracting it, similar to sharks (Carroll and Wainwright, 2003). Wanner et al. (2007a) and Gerrity et al. (2006) used gastric lavage to sample the stomach contents of hatchery-reared pallid sturgeon, and both studies found that juvenile pallid sturgeon were piscivorous. Hoover et al. (2007) used a colonic flushing technique and also found that fish, especially chub species, were a large portion of the pallid sturgeon diet. Comparing shovelnose and pallid sturgeon food habits has indicated that early in their life cycles, they both feed on invertebrates, especially mayflies and non-biting midges. However, results of a study done by Gerrity et al. (2006) on wild-caught juvenile pallid and shovelnose sturgeon confirmed that juvenile pallid sturgeon and juvenile shovelnose sturgeon use different food resources. The study found that fish were an important diet component of juvenile pallid sturgeon, while juvenile shovelnose sturgeon fed primarily on aquatic insects. Several studies have reported that pallid sturgeon feed specifically on native minnow species and show preference toward species of the genus *Macrhybopsis* (Gerrity et al., 2006; Hoover et al., 2007; Wanner et al., 2007a).

Habitat Requirements

Pallid sturgeon are considered to be well adapted for life on the river bottom in swift waters of large, turbid, free-flowing rivers (USFWS, 1993). Pallid sturgeon evolved in the diverse and ephemeral environments of the Missouri and Mississippi rivers. While most habitat descriptions are based on juvenile or adult fish, the habitat used by different life stages of pallid sturgeon varies widely (Wildhaber et al., 2007).

CHANNEL SHAPE AND STRUCTURE

Historically, the range of the pallid sturgeon was composed of large rivers with shallow braided channels and shifting sandbars (Peters and Parham, 2008a). In the channelized sections of the lower Missouri River (RPMA 4), the habitat has been considered to be poor for native riverine species (Peters and Parham, 2008a); however, pallid sturgeon have been documented in areas near wing dikes (Korschgen, 2007; Laustrup et al., 2007). In the upper Missouri and Yellowstone rivers, studies have found that pallid sturgeon were commonly located in areas with sandbars and sandy substrates (Bramblett and White, 2001). The Mississippi River habitat studies found that pallid sturgeon preferred and selected main channel border, downstream island tips, areas between wing dams, and areas on wing dam tips (Hurley et al., 2004; Sheehan et al., 2000). These studies found that pallid sturgeon did not select areas in the main channel, downstream from wing dams, and upstream of wing dam habitats.

DISCHARGE AND FLOW

River discharge can influence the amount, quality, and/or accessibility of riverine habitats of pallid sturgeon. In the Mississippi River, habitat use by pallid sturgeon was associated with main channel areas during normal flows, but shifted to areas associated with wing dikes during flood flows (Hurley et al., 2004; Sheehan et al., 2000).

In addition to changes in the amount of water discharged, outflows from dams on the Missouri River have clear and cool water from hypolimnetic releases for hydroelectric power generation. As a result, for an undetermined distance downstream of a dam, the thermal habitat is altered with respect to spawning habitats (Peters and Parham, 2008a).

DEPTH

Recorded depths where pallid sturgeon are found vary widely. Most studies have shown pallid sturgeon prefer to use the deepest water available, which conforms to other habitat requirements. A study done on juvenile pallid sturgeon in a laboratory flume found the fish to be using deep water habitats (from 28.7 to 36.6 inches [73 to 93 centimeters]) more than expected (Allen et al., 2007). A range of water depths where pallid sturgeon were found in the Missouri River in South Dakota was 13 to 16 feet in depth (Erickson, 1992).

VELOCITY

Several studies have been done on pallid sturgeon preference of velocity. Generally, pallid sturgeon have been found in the Missouri River in deep pools at the downstream ends of chutes and sandbars (USFWS, 1993). Findings from a study on the Missouri River in South Dakota indicate that pallid sturgeon most frequently occupy river bottoms where velocity ranges from 0.3 to 1 feet per second (Erickson, 1992). Studies on microhabitat selection in Montana found that pallid sturgeon are most frequently associated with water velocity ranging from 1.3 to 3.0 meters per second (USFWS, 1993).

SUBSTRATE

Pallid sturgeon are most frequently caught over a sand bottom, which is the predominant bottom substrate within the species range on the Missouri and Mississippi rivers. Pallid sturgeon caught in the Yellowstone River were found over a substrate of mainly gravel and rock (Watson and Stewart, 1991, as cited in USFWS, 1993). Bramblett and White (2001), Hurley et al. (2004), Peters and Parham (2008b), Snook (2001), and Swigle (2003) all note the preponderance of use of sand substrate by pallid sturgeon. In a laboratory study (Allen et al., 2007), juvenile pallid sturgeon were found to used sand to a greater degree than expected and gravel to a lesser degree. In the Platte River, pallid sturgeon showed a strong preference for sandy substrates.

TEMPERATURE

Pallid sturgeon inhabit areas where water temperatures range from 32 to 86°F, which is the range of water temperature in the Missouri and Mississippi rivers. There have been very few studies to indicate temperature preference or the effects of temperature on the species. Curtis (1990, as cited in USFWS, 1993) found no relation between surface water temperatures and depth used by shovelnose sturgeon on the Mississippi River and no indication that shovelnose sturgeon were moving into deeper, cooler water (if available) as water temperature increased. Because there is little information available on pallid sturgeon spawning, spawning requirements with regard to temperature are extrapolated from what is known regarding shovelnose sturgeon spawning.

Shovelnose sturgeon spawn in the Missouri River near Vermillion, South Dakota, when water temperatures reach 64 to 66°F in late May to June (Moos, 1978, as cited in USFWS, 1993). Shovelnose sturgeon spawning in the Tongue River, Montana, a tributary to the Yellowstone River, occurs from early June to mid-July at water temperatures between 61 to 70°F (Elser et al., 1977, as cited in USFWS 1993).

In a laboratory setting, Adams et al. (2003) found that temperature was a major factor in the critical swimming speed that juvenile pallid sturgeon could maintain for a period of time in a flume setting. At 50°F, they could maintain a slower speed (5.9 inches [15.05 centimeters] per second), while at 68°F, they could maintain a much faster speed (14.1 inches [35.93 centimeters] per second). Hurley et al. (2004) found differences in the habitats used by pallid sturgeon above versus below 50°F. In the Platte River, temperature at the point of capture of pallid sturgeon by trotline or net ranged from 49.8 to 76.8°F and averaged around 59°F (Peters and Parham, 2008a). Snook (2001) found temperatures at radio telemetry locations of hatchery-reared pallid sturgeon in the lower Platte River ranged from 52.5 to 92.7°F. Telemetry studies conducted by Peters and Parham (2008b) and Swigle (2003) found pallid sturgeon located at temperatures ranging from 38.3 to 76.8°F.

TURBIDITY/SUSPENDED SOLIDS

Pallid sturgeon occupy turbid river systems. Erickson (1992) studied pallid sturgeon habitat preference in South Dakota and found turbidity levels where pallid sturgeon were collected in the range from 31.3 Nephelometric turbidity units (NTU) to 137.6 NTU. In a laboratory study (Allen et al., 2007), juvenile pallid sturgeon used dark and very dark conditions to a greater extent than expected while avoiding cover. Studies of the retina of pallid sturgeon indicate adaptation to a turbid environment (Sillman et al., 2005). In the Platte River, suspended solids concentrations at the point of capture of pallid sturgeon ranged from 110.5 to 336 milligrams per Liter (mg/L) and averaged 171.5 mg/L (Peters and Parham, 2008b). Total suspended solids concentrations at telemetry locations of pallid sturgeon ranged from 86 to 1,228 mg/L and averaged 385 mg/L (Peters and Parham, 2008b; Swigle, 2003).

Critical Habitat

Critical habitat, as described by the ESA, has not been designated for the pallid sturgeon.

Potential Habitat in the Action Area

The pallid sturgeon is not currently known to occur within the Action Area, and no suitable habitat for this species exists within the Action Area. The Missouri River floodplain wetlands that occur within the Action Area are hydrologically connected; however, the substrate, vegetation, and stagnant nature of these wetlands do not support pallid sturgeon habitat.

Effects of the Project

It is highly unlikely that pallid sturgeon would use the wetlands located within the Action Area as this species prefers turbid main channel and backwater chute areas for breeding, migrating, and foraging. The pallid sturgeon is a large-river species and rarely travels into adjacent marshes of the type found where project construction would occur. Because of the direct hydrologic connection between the wetlands and the Missouri River, there is some potential during high water periods for accidental incursion into the Action Area. However, the habitat within the Action Area is not typically

considered suitable for or preferable to the pallid sturgeon. Because of the lack of suitable habitat within the Action Area, the project would have no effect on the pallid sturgeon.

2.2.7 Western Prairie Fringed Orchid

Species Status, Distribution, Biology, and Habitat Requirements

The western prairie fringed orchid (*Platanthera praeclara*) was federally listed as threatened on September 28, 1989 (54 FR 39857-39863). The western prairie fringed orchid is restricted to west of the Mississippi River and currently occurs in Iowa, Kansas, Minnesota, Nebraska, and North Dakota, as well as in Manitoba, Canada. This species has also been documented in South Dakota and Wyoming (U.S. Department of Agriculture, no date). In 1996, USFWS issued a recovery plan for the western prairie fringed orchid. On March 30, 2006, USFWS initiated a 5-year review of this species (71 FR 16176-16177), which was completed and summarized in February 2009 (USFWS, February 2009).

Status and Distribution

The western prairie fringed orchid continues to decline across its range, with less than 40 percent of the original range-wide population remaining (USFWS, May 3, 2011). Currently, known populations exist in six states (Iowa, Kansas, Minnesota, Missouri, Nebraska, and North Dakota) and in Canada (USFWS, March 14, 2011). The largest population of concentrated orchids is located in North Dakota. Large populations also exist in Manitoba and northwest Minnesota. Smaller population complexes exist in Nebraska, Minnesota, and Iowa (USFWS, May 3, 2011).

The western prairie fringed orchid is found in the eastern two-thirds of Nebraska, from Cherry and Keith counties in the west to the Missouri River in the east. Surveys completed in 1996 by USFWS for the Western Prairie Fringed Orchid Recovery Plan documented known populations in six counties in Nebraska (USFWS, 1996). Currently, extant populations are known to occur in 18 counties and may occur at other sites in Nebraska. Currently, there are no known populations of western prairie fringed orchids in Knox County or in the Action Area.

Biology

There is evidence that orchid ecology is tied to mycorrhizal associations (that is, a symbiotic relationship between soil fungi and roots of plants) (USFWS, February 2009). In Nebraska, the western prairie fringed orchid blooms almost exclusively from the last week of June through the first two weeks of July. Flowering may be suppressed by litter accumulation and stimulated by fire (USFWS, 1996).

Habitat Requirements

This species is a perennial orchid found in wet-mesic to mesic tallgrass prairie, specifically in unplowed, calcareous prairies and sedge meadows. The soils in these regions are usually Udolls or Udic Ustolls (humid to intermittently dry mollisols, or prairie soils) on gentle to moderate slopes. In tallgrass prairies, the western prairie fringed orchid is typically associated with big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), and little bluestem (*Schizachyrium scoparium*). In wetter growth sites, this species is commonly associated with tufted hairgrass (*Deschampsia caespitosa*) and switchgrass (*Panicum virgatum*). In sedge meadows, this species is often dominated by sedges (*Carex* spp.) and spikerushes (*Eleocharis* spp.) (USFWS, 1996).

Critical Habitat

Critical habitat, as described by the ESA, has not been designated for the western prairie fringed orchid.

Potential Habitat in the Action Area

The wetlands located within the Action Area mostly consist of monotypic vegetation stands of cattails (*Typha* spp.) and reed canarygrass (*Phalaris arundinacia*). A majority of these wetlands has been classified as semi-permanently flooded palustrine emergent wetlands and almost always inundated. Additionally, other areas that may have been orchid habitat at one time are now frequently disturbed or farmed. The western prairie fringed orchid is not currently known to occur within the Action Area, and no suitable habitat for this species exists within the Action Area.

Effects of the Project

No known populations of western prairie fringed orchid occur in the Action Area. The project would have no effect on the western prairie fringed orchid because the Action Area contains no suitable habitat for this species.

2.2.8 Northern Long-Eared Bat

Species Status, Distribution, Biology, and Habitat Requirements

Status and Distribution

The northern long-eared bat (*Myotis septentrionalis*) was federally listed as threatened on May 4, 2015 (80 FR 17974-18033). No critical habitat has been designated for this species. The northern long-eared bat is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to the southern Northwest Territories and eastern British Columbia. The species' range includes 37 states (USFWS, 2015d).

The northern long-eared bat is found throughout the eastern two-thirds and along the northern portion of the state of Nebraska (USFWS 2015c).

Biology

The northern long-eared bat is a medium-sized bat about 3 to 3.7 inches in length but with a wingspan of 9 to 10 inches. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*, which are actually bats noted for their small ears (*Myotis* means mouse-eared).

White-nose syndrome, a fungal disease known to affect bats, is currently the predominant threat to this bat, especially throughout the Northeast where the species has declined by up to 99 percent from pre-white-nose syndrome levels at many hibernation sites. Although the disease has not yet spread throughout the northern long-eared bat's entire range (white-nose syndrome is currently found in at least 25 of 37 states where the northern long-eared bat occurs), it continues to spread (USFWS, 2015d).

Habitat Requirements

During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags. Females typically roost from late May to early June to late July. Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats have also been found rarely roosting in structures, like barns and sheds (USFWS 2015e).

Critical Habitat

No critical habitat has been designated for northern long-eared bats.

Potential Habitat in the Action Area

There are no known records of northern long-eared bat in Knox County, but there are records in the neighboring Holt County (NatureServe 2014). There is potential for the bat to roost in the woodlands located within the Action Area.

Effects of the Project

Alternative A7 would impact 67 acres of woodland habitat. A habitat survey should be conducted prior to construction. In addition, NDOR would be able to clear and grub the woodland areas outside of the northern long-eared bat's roosting season. Therefore, the project may affect, but are not likely to adversely affect, northern long-eared bats.

3 Cumulative Effects

Cumulative effects are those effects of future state or private activities, not involving federal activities, which are reasonably certain to occur within the Action Area (50 CFR 402.02). Future federal actions are not considered within the category of cumulative effects for ESA purposes because they require separate consultations under Section 7 of the ESA, after which they are considered part of the environmental baseline for future Section 7 consultations. Guidance for determining cumulative effects in the Endangered Species Consultation Handbook (USFWS and National Marine Fisheries Service, March 1998) states the following:

> Indicators of actions 'reasonably certain to occur' may include, but are not limited to: approval of the action by State, tribal, or local agencies or governments (e.g., permits, grants); indications by State, tribal or local agencies or governments that granting authority for the action is imminent; project sponsors' assurance the action will proceed; obligation of venture capital; or initiation of contracts. The more State, tribal or local administrative discretion remaining to be exercised before a proposed non-Federal action can proceed, the less there is a reasonable certainty the project will be authorized.

There are no reasonably foreseeable state, tribal, or local agency future actions in the Action Area that could have a cumulative effect on listed species.

Therefore, there are no non-federal activities are known within the Action Area that would have a cumulative impact on federally listed insects, birds, fish, plants or mammals.

4 Determination of Effects

In fulfilling the obligations under Section 7(a)(2) of the ESA, the information presented in this BA represents the best data currently available to assess the potential effects of constructing the parallel alignment of N-12 on eight federally listed species within the Action Area.

After reviewing the current status of the listed species, the environmental baseline for the Action Area, the anticipated effects of the project, and the cumulative effects, the applicant concludes that the project would have the following effects on federally listed species within the Action Area.

Table 4-1. Determination of Effects

Common Name	Federal Status[1]	Potential for Occurrence
American burying beetle	E	May Affect, Not Likely to Adversely Affect
Interior least tern	E	May Affect, Not Likely to Adversely Affect
Piping plover	T	No Effect
Rufa red knot	T	No Effect
Whooping crane	E	May Affect, Not Likely to Adversely Affect
Pallid sturgeon	E	No Effect
Western prairie fringed orchid	T	No Effect
Northern long-eared bat	T	May Affect, Not Likely to Adversely Affect

Note:
[1] E = endangered; T = threatened

4.1 American Burying Beetle

Currently, no known populations of ABB exist within the Action Area. Approximately 123 acres of potential habitat (pasture/range/grassland and woodlands) would be directly impacted by the project. Due to the limited amount of potentially suitable habitat impacted by the project, due to the current status of the species in the Action Area, and if appropriate conservation conditions are followed, the project may affect, but is not likely to adversely affect, the ABB.

4.2 Interior Least Tern

Although interior least terns may use the Missouri River corridor and the Niobrara River during migration and breeding seasons, the Missouri River wetlands in the Action Area, while connected to the river hydrologically, do not contain suitable breeding or nesting habitat for this species. The project would impact approximately 91 acres of wetlands and open waters within the Alternative A7 permanent area of impact. Because interior least terns may forage long distances from their nests for minnows and other small fish, their occurrence in the Action Area would be limited and the amount of impact is considered insignificant and discountable. These impacts would occur to less than 2 percent of the total wetland habitat, both within the Action Area and downstream to the Lewis and Clark Lake delta area of the floodplain. Thousands of acres of additional habitat are available within the interior least tern's range. The project may affect, but is not likely to adversely affect, interior least terns.

4.3 Piping Plover

The Action Area does not contain suitable breeding or foraging habitat for piping plovers. No exposed sand or gravel areas are located within the Action Area to provide breeding habitat for this species. In addition, the wetlands located within the Action Area are consistently inundated and do not provide adequate shallow water on sand and gravel substrates for foraging piping plovers. This species is not known to occur in the Action Area; therefore, the project would have no effect on piping plovers.

4.4 Whooping Crane

Whooping cranes may use the Missouri River corridor, associated tributaries, and the Niobrara River during migration for foraging. The Action Area is located on the eastern edge of the main migration corridor used by this species. Because of this, the potential is low for migrating whooping cranes to rely on the Action Area as their primary foraging site. The project would impact approximately 91 acres of wetlands and open waters within the Alternative A7 permanent area of impact. However, the impact on wetlands and open water is not likely to adversely affect this species. The wetland impacts would affect less than 2 percent of the total wetland habitat within the Missouri River floodplain in the Action Area and downstream to the Lewis and Clark Lake delta. Thousands of acres of additional foraging habitat are available within the whooping crane's range. Based on the rarity of sightings and the relative location of the project to the main migration corridor within the Action Area, the project may affect, but is not likely to adversely affect, the whooping crane.

4.5 Pallid Sturgeon

It is highly unlikely that pallid sturgeon would use the wetlands located within the Action Area as this species prefers turbid main channel and backwater chute areas for breeding, migrating, and foraging. The pallid sturgeon is a large-river species and rarely travels into adjacent marshes of the type found where project construction would occur. Because of the direct hydrologic connection between the wetlands and the Missouri River, there is some potential during high water periods for accidental incursion into the Action Area. However, the habitat within the Action Area is not typically considered suitable for or preferable to the pallid sturgeon. Because of the lack of suitable habitat within the Action Area, the project would have no effect on the pallid sturgeon.

4.6 Western Prairie Fringed Orchid

No known populations of western prairie fringed orchid occur in the Action Area. The project would have no effect on the western prairie fringed orchid because the Action Area contains no suitable habitat for this species.

4.7 Northern Long-Eared Bat

Alternative A7 would impact 67 acres of woodland habitat. There are 897 acres of woodland habitat within the Study Area, which means that approximately 7 percent of the available habitat would be affected. A habitat survey should be conducted prior to construction. In addition, NDOR would be able to clear and grub the woodland areas outside of the northern long-eared bat's roosting season. Therefore, the project may affect, but are not likely to adversely affect, northern long-eared bats.

5 References

40 CFR 1502.14(d). Alternatives Including the Proposed Action.

40 CFR 1508.25(b). Scope.

50 CFR 402.02. Definitions.

50 CFR 424.12(b). Criteria for Designating Critical Habitat.

32 FR 4001. March 11, 1967. Endangered Species.

50 FR 21784-21792. May 28, 1985. Endangered and Threatened Wildlife and Plants; Interior Population of the Least Tern Determined to be Endangered; Final Rule.

50 FR 50726-50734. December 11, 1985. Endangered and Threatened Wildlife and Plants; Determination of Endangered and Threatened Status for the Piping Plover; Final Rule.

54 FR 29652-29655. July 13, 1989. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the American Burying Beetle; Final Rule.

54 FR 39857-39863. September 28, 1989. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Eastern and Western Prairie Fringed Orchids; Final Rule.

55 FR 36641-36647. September 6, 1990. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Pallid Sturgeon; Final Rule.

67 FR 57638-57717. September 11, 2002. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover; Final Rule. Department of the Interior, Fish and Wildlife Service.

70 FR 39326-39327. July 7, 2005. Endangered and Threatened Wildlife and Plants; Initiation of a 5-Year Review of Black-Footed Ferret (*Mustela nigripes*) and Pallid Sturgeon (*Scaphirhynchus albus*); Notice.

71 FR 16176-16177. March 30, 2006. Endangered and Threatened Wildlife and Plants; 5-Year Review of Five Midwestern Species; Notice of Review.

72 FR 4018-4019. January 29, 2007. Endangered and Threatened Wildlife and Plants; Initiation of a 5-Year Review of Ten Listed Northeastern Species; Notice.

72 FR 29544. May 29, 2007. Notice of Availability of the Revised Recovery Plan for the Whooping Crane (*Grus americana*).

73 FR 21643-21645. April 22, 2008. Endangered and Threatened Wildlife and Plants; 5-Year Reviews; Notice of Initiation of Review; Request for Information on Seven Listed Midwestern Species.

73 FR 56860-56862. September 30, 2008. Endangered and Threatened Wildlife and Plants; 5-Year Review; Notice of Initiation of Review; Request for Information on the Piping Plover (*Charadrius melodus*).

75 FR 15454-15456. March 29, 2010. Endangered and Threatened Wildlife and Plants; 5-Year Status Reviews of 14 Southwestern Species.

16 USC 1531-1544. Endangered Species Act of 1973, as amended.

Adams, S. R., G. L. Adams, and G. R. Parsons. 2003. "Critical swimming speed and behavior of juvenile shovelnose sturgeon and pallid sturgeon." *Transactions of the American Fisheries Society* 132: 392–397.

Allen, T.C., Q.E. Phelps, R.D. Davinroy, and D.M. Lamm. 2007. "A laboratory examination of substrate, water depth, and light use at two water velocity levels by individual juvenile pallid (Scaphirynchus albus) and shovelnose (Scaphirynchus platorynchus) sturgeon." *Journal of Applied Ichthyology* 23: 375–381.

Aron, C. 2005. *South Dakota Interior Least Tern (Sterna antillarum athalassos) and Piping Plover (Charadrius melodus) Management Plan*. Wildlife Division Report No. 2005-02. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

———. 2006. *South Dakota Pallid Sturgeon (Scaphirhynchus albus) Management Plan*. Wildlife Division Report No. 2006-01. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Atwood, Jonathan L., and Paul R. Kelly. 1984. "Fish dropped on breeding colonies as indicators of least tern food habits." *The Wilson Bulletin* 96 (1): 34–47.

Austin, J.E., and A.L. Richert. 2001. *A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-1999*. U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Available online at: http://www.npwrc.usgs.gov/resource/birds/wcdata/pdf/wcdata.pdf.

Bailey, R.M., and F.B. Cross. 1954. "River sturgeons of the American genus Scaphirhynchus: characters, distribution, and synonymy." *Papers of the Michigan Academy of Science, Arts and Letters* 39: 169-208.

Bailey, Reeve M., and Marvin O. Allum. 1962. *Fishes of South Dakota*. No. 119. Miscellaneous Publications series. Museum of Zoology, University of Michigan.

Bishop, A.A., M. Albrecht, W.W. Hoback, and K.M. Skinner. 2002. "A Comparison of an Ecological Model and GIS Special Analysis to Describe Niche Partitioning Amongst Carrion Beetles in Nebraska." *Transactions in GIS* 6 (4): 457–470.

Braaten, P.J., D.B. Fuller, R.D. Lott, and G.R. Jordan. 2009. "An Estimate of the Historic Population Size of Adult Pallid Sturgeon in the Upper Missouri River Basin, Montana and North Dakota." *Journal of Applied Ichthyology* 25: 2–7.

Bramblett, R.G., and R.G. White. 2001. "Habitat use and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri Rivers in Montana and North Dakota." *Transactions of the American Fisheries Society* 130: 1006–1025.

Brown, Mary Bomberger, and Joel G. Jorgensen. 2008. 2008 Interior Least Tern and Piping Plover Monitoring, Research, Management, and Outreach Report for the Lower Platte River, Nebraska. Joint report of the Tern and Plover Conservation Partnership and the Nebraska Game and Parks Commission.

Cairns, Winifred E. 1982. "Biology and Behavior of Breeding Piping Plovers." *Wilson Bulletin* 94 (4): 531–545.

Canadian Wildlife Service and USFWS. 2007. *International Recovery Plan for the Whooping Crane*. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW), and U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Carlson, Douglas M., William L. Pflieger, Linden Trial, and Pamela S. Haverland. 1985. "Distribution, Biology, and Hybridization of *Scaphirhynchus albus* and *S. platorynchus* in the Missouri and Mississippi Rivers." *Environmental Biology of Fishes* 14 (1): 51–59.

Carreker, R.G. 1985. *Habitat Suitability Index Models: Least Tern.* U.S. Fish and Wildlife Service Biological Report 82(10.103). Available online at: http://www.nwrc.usgs.gov/wdb/pub/hsi/hsi-103.pdf.

Carroll, Andrew M., and Peter C. Wainwright. 2003. "Functional Morphology of Prey Capture in the Sturgeon, *Scaphirhynchus albus*." *Journal of Morphology* 256: 270–284.

Cope, E. D. 1897. "A contribution to the zoology of Montana." *American Naturalist* 13: 432–441.

Corps. March 30, 2009. Personal communication between Greg Pavelka, Corps Biologist, and Melissa Marinovich, HDR.

———. October 2010. Missouri River Recovery Program: Integrated Science Program General Science Questions & Key Findings. U.S. Army Corps of Engineers, Omaha District. Paper 66.

———. May 4, 2015. Personal communication between Chantel Cook, Corps Tern and Plover Monitoring Program Coordinator, and Meagan Schnoor, HDR.

Cuthbert, F.J., B. Scholtens, L.C. Wemmer, and R. McLain. 1999. "Gizzard Contents of Piping Plover Chicks in Northern Michigan." *Wilson Bulletin* 111 (1): 121–123.

Dirks, B., M. Schwalbach, K.F. Higgins, and C. Kruse. 1993. "Soil Substrates, Objects, and Vegetation at Piping Plover and Interior Least Tern Nest Sites in South Dakota." *Proceedings, The Missouri River and its Tributaries: Piping Plover and Least Tern Symposium*, edited by K.F. Higgins and M.R. Brashier. Brookings, South Dakota: South Dakota State University, Department of Wildlife and Fisheries Sciences.

Ducey, J.E. 2000. Birds of the Untamed West: The History of Birdlife in Nebraska, 1750-1875. Omaha, Nebraska: Making History.

Dugger, K.M. 1997. Foraging ecology and reproductive success of least terns nesting on the Lower Mississippi River. Ph.D. Dissertation. University of Missouri, Columbia.

Elliott-Smith, E., S.M. Haig, and B.M. Powers. 2009. *Data from the 2006 International Piping Plover Census*. USGS Data Series 426. Reston, Virginia.

Erickson, Jonathan D. 1992. *Habitat Selection and Movement of Pallid Sturgeon in Lake Sharpe, South Dakota*. A thesis submitted in partial fulfillment of the requirements for the degree, Master of Science. Brookings, South Dakota: South Dakota State University.

Ferland, C.L., and S.M. Haig. 2002. *2001 International Piping Plover Census*. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon.

Gerrity, Paul C., Christopher S. Guy, and William M. Gardner. 2006. "Juvenile Pallid Sturgeon and Piscivorous: A Call for Conserving Native Cyprinids." *Transactions of the American Fisheries Society* 135: 604–609.

Grady, Joanne, Jim Milligan, Craig Gemming, David Herzog, Gerald Mestl, Lannie Miller, K. Hurley, Paul Wills, and Robert Sheehan. 2001. *Pallid and Shovelnose Sturgeon in the Lower Missouri and Middle Mississippi Rivers*. Final Report Prepared for MICRA.

Government of Canada. 2015. "Species Profile: Red knot *rufa* subspecies." March 23. http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=980.

Haig, S.M., and E. Elliot-Smith. 2004. "Piping Plover (*Charadrius melodus*)." *Birds of North America Online*, edited by A. Poole. Ithaca, New York: Cornell Laboratory of Ornithology.

Haig, S.M., and L.W. Oring. 1985. "The Distribution and Status of the Piping Plover throughout the Annual Cycle." *Journal of Field Ornithology* 56: 334–345.

Haig, Susan M. 1992. "*Charadrius melodus*, Piping Plover." *The Birds of North America*, *No. 2*, edited by A. Poole, P. Settenheim, and F. Gills. Philadelphia, Pennsylvania: the Academy of Natural Sciences; Washington, D.C.: the American Ornithologists' Union.

Hoback, W. Wyatt. 2009. *NDOR American Burying Beetle Research Final Report*. University of Nebraska at Kearney. Available online at: http://nlc1.nlc.state.ne.us/epubs/R6000/B282-2008.pdf.

Hoover, J.J., S.G. George, and K.J. Killgore. 2007. "Diet of shovelnose sturgeon and pallid sturgeon in the free-flowing Mississippi River." *Journal of Applied Ichthyology* 23: 494–499.

Hurley, K. L., R. J. Sheehan, R. C. Heidinger, P. S. Wills, and B. Clevenstine. 2004. "Habitat use by middle Mississippi River pallid sturgeon." *Transactions of the American Fisheries Society* 133:4 1033–1041.

Keenlyne, K.D., and L.G. Jenkins. 1993. "Age at Sexual Maturity of the Pallid Sturgeon." *Transactions of the American Fisheries Society* 122: 393–396.

Kirsch, E.M. 1996. "Habitat selection and productivity of least terns on the lower Plate River, Nebraska." *Wildlife Monographs* 132: 3–48.

Korschgen, C.E., ed. 2007. Factors Affecting the Reproduction, Recruitment, Habitat, and Population Dynamics of Pallid Sturgeon and Shovelnose Sturgeon in the Missouri River. U.S. Geological Survey Open-File Report 2007-1262.

Kynard, B., E. Parker, D. Pugh, and T. Parker. 2007. "Use of Laboratory Studies to Develop a Dispersal Model for Missouri River Pallid Sturgeon Early Life Intervals." *Journal of Applied Ichthyology* 23: 365–374.

Kynard, Boyd, Erika Henyey, and Martin Horgan. 2002. "Ontogenetic Behavior, Migration, and Social Behavior of Pallid Sturgeon, *Scaphirhynchus albus*, and Shovelnose Sturgeon, *S. platorynchus*, with Notes on the Adaptive Significance of Body Color." *Environmental Biology of Fishes* 63: 389–403.

Laustrup, Mark S., Robert B. Jacobson, and Darin G Simpkins. 2007. *Distribution of Potential Spawning Habitat for Sturgeon in the Lower Missouri River, 2003-06*. U.S. Geological Survey Open-File Report 2007-1192.

Lott, Casey A. November 2006. Distribution and Abundance of the Interior Population of the Least Tern (Sternula antillarum), 2005: A Review of the First Complete Range-Wide Survey in the Context of Historic and Ongoing Monitoring Efforts. ERDC/EL TR-06-13. Prepared for U.S. Army Corps of Engineers. Washington, DC 20314-1000.

Mitchell, Wilma A. 1998. Species Profile: Least Tern (Sterna antillarum), Interior Population, on Military Installations in the Southeastern United States. Technical Report SERDP-98-1. Prepared for U.S. Army Corps of Engineers.

NatureServe. 2008. "NatureServe Explorer: An Online Encyclopedia of Life" [web application]. Version 4.6. Arlington, Virginia: NatureServe. Retrieved on May 9, 2008. http://www.natureserve.org/explorer/.

———. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 (2009). NatureServe, Arlington, Virginia. Accessed 21 January 2015. http://www.natureserve.org/explorer. *Myotis septentrionalis* (Northern Long-eared Bat) http://explorer.natureserve.org/servlet/NatureServe?searchName=Myotis+septentrionalis.

———. 2015. "NatureServe Explorer: An Online Encyclopedia of Life" [web application]. *Calidris canutus rufa*. Version 7.1. Arlington, Virginia: NatureServe. January. http://explorer.natureserve.org/servlet/NatureServe?searchName=Calidris+canutus+rufa.

NDOR. July 7, 2009. Memorandum from Robert Carnazzo, Hydraulics Unit Head, Roadway Design Division, NDOR, to file.

———. 2009b. Memorandum from Robert Carnazzo, Hydraulics Unit Head, Roadway Design Division, NDOR, to file. July 7.

———. 2013. Email from Len Sand, NDOR, to Becky Latka, USACE, Meagan Schnoor, HDR, and Matt Pillard, HDR, regarding June 11, 2013, progress meeting action items, including attachments of NDOR comments on the draft newsletter, project design criteria, and justification memorandum N-14. June 26.

NGPC. December 2008. Assessment of the Pallid Sturgeon, Least Tern and Piping Plover in the Lower Platte River. Nebraska Game and Parks Commission, Lincoln, Nebraska.

———. January 15, 2010. Letter from Michelle R. Koch, Environmental Analyst Supervisor, Nebraska Natural Heritage Program, NGPC, to Rebecca J. Latka, Corps, regarding request for concurrence on species list for the N-12 Project.

———. January 29, 2010. Letter from Carey Grell, Environmental Analyst, Realty and Environmental Services Division, NGPC, to Melissa Marinovich, HDR, regarding request for species occurrence for the N-12 Project.

———. March 2014. "Estimated Current Range of American Burying Beetle (*Nicrophorus americanus*). http://outdoornebraska.ne.gov/wildlife/programs/nongame/Heritage/images/Maps/American%20Burying%20Beetle.jpg.

———. June 11, 2015. Letter from Carey Grell, Environmental Analyst Supervisor, NGPC, to Rebecca Latka, USACE, regarding Updated Species List.

Nicholls, Janie L., and Guy A. Baldassarre. 1990. "Habitat Associations of Piping Plovers Wintering in the United States." *Wilson Bull* 102 (4): 581–590.

Niobrara Public Schools. 2009. Letter from the Office of the Superintendent, Niobrara Public Schools, to Meagan Hall, HDR, regarding the proposed improvements on N-12 east and west of Niobrara. August 10.

NPS. 1997. Missouri/Niobrara/Verdigre Creek, National Recreational Rivers, Nebraska and South Dakota: Final, General Management Plan, Environmental Impact Statement. Volume 3. National Park Service, Denver Service Center.

———. June 30, 2009. Personal communication between Stephen K. Wilson, NPS Biologist, and Melissa Marinovich, HDR.

———. May 5, 2015. Personal communication between Lisa Yager, NPS Biologist, and Meagan Schnoor, HDR.

NRC. 2004. *Endangered and threatened species of the Platte River*. Washington, DC: National Academies Press.

Office of Protected Resources. December 12, 2011. "Candidate, Proposed, and Delisted Species Under the Endangered Species Act (ESA)." *NOAA Fisheries: Office of Protected Resources*. Retrieved January 31, 2012. http://www.nmfs.noaa.gov/pr/species/esa/other.htm.

Panella, M.J. 2013. American burying beetle (*Nicrophorus americanus*). A species conservation assessment for the Nebraska Natural Legacy Project. March. http://outdoornebraska.ne.gov/wildlife/programs/legacy/pdfs/assessments/ABB.pdf.

Peters, E.J., and J.E. Parham. 2008a. Pallid Sturgeon Literature Review: Final Report to the Platte River Recovery Implementation Program.

———. 2008b. *Ecology and Management of Sturgeon in the Lower Platte River, Nebraska*. Nebraska Technical Series No. 18. Nebraska Game and Parks Commission. Lincoln, Nebraska.

Prindiville Gaines, E., and M. R. Ryan. 1988. "Piping Plover Habitat use and Reproductive Success in North Dakota." *The Journal of Wildlife Management* 52 (2): 266–273.

Ratcliffe, Brett C., and Mary Liz Jameson. 1992. "New Nebraska Occurrences of the Endangered American Burying Beetle (Coleoptera: Silphidae)." *The Coleopterists Bulletin* 46 (4): 421–425.

Schneider, Rick, Kristal Stoner, Gerry Steinauer, Melissa Panella, and Mark Humpert. 2011. *The Nebraska Natural Legacy Project: State Wildlife Action Plan*. Second Edition. Nebraska Game and Parks Commission, Lincoln, Nebraska. Available online at: http://outdoornebraska.ne.gov/wildlife/programs/legacy/pdfs/NE%20Natural%20Legacy%20Project%20-%202nd%20edition.pdf.

Schweitzer, Sara H., and David M. Leslie, Jr. 1996. "Foraging Patterns of the Least Tern (*Sterna antillarum*) in North-Central Oklahoma." *The Southwestern Naturalist* 41 (3): 307–314.

Sharpe, Roger S., W. Ross Silcock, and Joel G. Jorgensen. 2001. *Birds of Nebraska: Their Distribution and Temporal Occurrence*. University of Nebraska Press. Pgs. 153–210.

Sheehan, Robert, Roy Heidinger, Keith Hurley, Paul Wills, and Michael A. Schmidt. 1997. "Middle Mississippi River Pallid Sturgeon Habitat Use Project". *Reports*, Paper 9, Southern Illinois University Carbondale.

Sidle, John G. 1993. "Least Tern and Piping Plover Use of Sand and Gravel Pits along the Platte and Loup Rivers, Nebraska." *Proceedings of the Missouri River and its Tributaries: Piping Plover and Least Tern Symposium-Workshop*, edited by K.F. Higgins, and M.R. Brashier. Brookings, South Dakota: South Dakota State University, Department of Wildlife and Fisheries Sciences.

Sillman, AJ, Beach AK, Dahlin DA, and Loew ER. 2005. "Photoreceptors and visual pigments in the retina of the fully anadromous green sturgeon (Acipenser medirostrus) and the potamodromous pallid sturgeon (Scaphirhynchus albus)." *Journal of Comparative Physiology A* 191: 799–811.

Simons, Andrew M., Robert M. Wood, Lucie S. Heath, Bernard R. Kuhajda, and Richard L. Mayden. 2001. "Phylogenetics of Scaphirhynchus Based on Mitochondrail DNA Sequences." *Transactions of the American Fisheries Society* 130: 359–366.

Smith, J.W., and R. B. Renken. 1990. *Improving the status of endangered species in Missouri: least tern investigations*. Final report, Jobs 1 and 2, Missouri Department of Conservation endangered species project SE-01-19.

———. 1993. "Reproductive Success of Least Terns in the Mississippi River Valley." *Colonial Waterbirds* 16 (1): 39–44.

Snook, V.A. 2001. Movements and Habitat Use by Hatchery-Reared Pallid Sturgeon in the Lower Platte River, Nebraska. Master of Science Thesis. University of Nebraska, Lincoln.

Snyder, D.E. 2002. "Pallid and Shovelnose Sturgeon Larvae – Morphological Description and Identification." *Journal of Applied Ichthyology* 18: 240–265.

South Dakota Game, Fish and Parks. August 29, 1997. "The American Burying Beetle in South Dakota." Retrieved on December 29, 2008. http://gfp.sd.gov/wildlife/management/diversity/american-burying-beetle.aspx

———. 2015. American burying beetle in South Dakota. April 18. Retrieved on April 18, 2015. http://gfp.sd.gov/wildlife/management/diversity/american-burying-beetle.aspx.

Steffensen, Kirk. April 2009. "Saving a Living Dinosaur." *Nebraskaland Magazine*. NGPC. Lincoln, Nebraska. Pgs. 38–43.

Stehn, Tom. August 30, 2011. *Whooping Crane Recovery Activities: October, 2010 – August, 2011*. Available online at: http://whoopingcrane.com/wp-content/uploads/2011/09/Wooping-Crane-Recovery-Activities-2011.pdf.

Swigle, Benjamin D. 2003. Movements and Habitat use by Shovelnose and Pallid Sturgeon in the Lower Platte River, Nebraska. Master of Science Thesis. University of Nebraska.

Szell, Christopher C., and Mark S. Woodrey. 2003. "Reproductive Ecology of the Least Tern along the Lower Mississippi River." *Waterbirds: The International Journal of Waterbird Biology* 26 (1): 35–43.

Thompson, Bruce C., Jerome A. Jackson, Joanna Burger, Laura A. Hill, Eileen M. Kirsh, and Jonathan L. Atwood. 1997. "*Sterna antillarum*, Least Tern." *The Birds of North America*. No. 290. Philadelphia, Pennsylvania: the Academy of Natural Sciences; Washington, D.C.: the American Ornithologists' Union.

Tibbs, J.E., and D.E. Galat. 1997. *Larval, Juvenile and Adult Small Fish Use of Scour Basins Connected to the Lower Missouri River*. Cooperative Fish and Wildlife Research Unit, University of Missouri, Columbia.

U.S. Department of Agriculture. No date. "PLANTS Profile: Platanthera praeclara Sheviak and Bowles." Retrieved February 2012. http://plants.usda.gov/java/profile?symbol=PLPR4.

U.S. District Court for the District of Nebraska. October 13, 2005. *Nebraska Habitat Conservation Coalition (P) v. U.S. Fish and Wildlife Service (D)*. Case: 4:03-cv-03059-LES-DLP. Document No. 53. Date filed: October 13, 2005.

USFWS. 1988. Great Lakes & Northern Great Plains Piping Plover Recovery Plan.

———. September 1990. *Recovery Plan for the Interior Population of the Least Tern* (Sterna antillarum). U.S. Fish and Wildlife Service, Grand Island, Nebraska, and Twin Cities, Minnesota. Available online at http://ecos.fws.gov/docs/recovery_plan/900919a.pdf.

———. 1991. *American Burying Beetle (Nicrophorus americanus) Recovery Plan*. U.S. Fish and Wildlife Service, Region 5. Available online at http://ecos.fws.gov/docs/recovery_plan/910927.pdf.

———. 1993. *Pallid Sturgeon (Scaphirhynchus albus) Recovery Plan*. Bismarck, North Dakota: U.S. Fish and Wildlife Service. Prepared for U.S. Fish and Wildlife Service, Denver, Colorado, Region 6.

———. 1996. *Western Prairie Fringed Orchid Recovery Plan (Platanthera praeclara)*. U.S. Fish and Wildlife Service, Ft. Snelling, Minnesota. Available online at http://ecos.fws.gov/docs/recovery_plan/960930a.pdf.

———. May 2, 1996. Piping Plover (*Charadrius melodus*) Atlantic Coast Population Revised Recovery Plan.

———. September 16, 2003. Recovery Plan for the Great Lakes Piping Plover (Charadrius melodus).

———. December 16, 2003. U.S. Fish and Wildlife Service 2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System. Available online at: http://www.nwd-mr.usace.army.mil/mmanual/FinalBO2003.pdf.

———. June 13, 2007. *Pallid Sturgeon (Scarphirhynchus albus) 5-Year Review Summary and Evaluation*. U.S. Fish and Wildlife Service, Billings, Montana. Available online at http://ecos.fws.gov/docs/five_year_review/doc1059.pdf.

———. March 2008. *American Burying Beetle (Nicrophorus americanus) 5-year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service, New England Field Office, Concord, New Hampshire. Available online at: http://ecos.fws.gov/docs/five_year_review/doc1968.pdf.

———. February 2009. *Western Prairie Fringed Orchid (Platanthera praeclara) 5-year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service, Twin Cities Field Office, Bloomington, Minnesota. Available online at: http://ecos.fws.gov/docs/five_year_review/doc2412.pdf.

———. April 15, 2009. Sightings Database. Received from Martha Tacha at USFWS on April 15, 2009.

———. September 29, 2009. *Piping Plover (Charadrius melodus) 5-Year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service, Northeast Region, Hadley, Massachusetts, and the Midwest Region's East Lansing Field Office, Michigan.

———. November 18, 2009. Letter from Ann L. Carlson, Acting Field Supervisor, to Rebecca J. Latka, Corps, regarding an updated species list for the N-12 Project.

———. July 2010. *Endangered, Threatened, Proposed, and Candidate Species in Nebraska Counties*. U.S. Fish and Wildlife Service, Nebraska Field Office, Grand Island, Nebraska. Available online at: http://www.fws.gov/mountain%2Dprairie/endspp/CountyLists/Nebraska.pdf.

———. March 2011. *Candidate species: Section 4 of the Endangered Species Act*. U.S. Fish and Wildlife Service, Endangered Species Program, Arlington, Virginia. Available online at: http://www.fws.gov/endangered/esa-library/pdf/candidate_species.pdf

———. March 14, 2011. "Western Prairie Fringed Orchid (*Platanthera praeclara*)." U.S. Fish and Wildlife Service, North Dakota Field Office, Mountain-Prairie Region. Retrieved September 26, 2011. http://www.fws.gov/northdakotafieldoffice/endspecies/species/western_prairie_fringed_orchid.htm.

———. May 3, 2011. "Western Prairie Fringed Orchid." U.S. Fish and Wildlife Service, South Dakota Field Office, Mountain-Prairie Region. Retrieved September 26, 2011. http://www.fws.gov/southdakotafieldoffice/ORCHID.HTM.

———. September 1, 2011. Letter from Michael D. George, Nebraska Field Supervisor, USFWS, to Rebecca J. Latka, Corps, regarding concurrence with an updated threatened and endangered species list for the N-12 Project.

———. September 27, 2011. "Species Profile: Whooping Crane (*Grus americana*)." Retrieved on September 27, 2011. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B003.

———. 2013. "Rufa red knot (*Calidris canutus rufa*)." September. http://www.fws.gov/northeast/redknot/pdf/Redknot_BWfactsheet092013.pdf.

———. 2015a. "Section 7 Consultation." April 8. http://www.fws.gov/Midwest/endangered/section7/section7.html.

———. 2015b. "Red Knot (*Calidris canutus rufa*)." http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DM.

———. 2015c. Endangered, Threatened, Proposed and Candidate Species, Nebraska Counties. Nebraska Field Office. March. http://www.fws.gov/nebraskaes/Library/NECounty2015.pdf.

———. 2015d. "Northern long-eared Bat (*Myotis septentrionalis*)" http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE

———. 2015e. "Northern Long-Eared Bat." Fact Sheet. April http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/NLEBFactSheet01April2015.pdf.

———. May 1, 2015. Letter from Eliza Hines, Nebraska Field Supervisor, USFWS, to Rebecca Latka, Project Manager, Corps.

USFWS and National Marine Fisheries Service. March 1998. Endangered Species Consultation Handbook, Procedures for Conducting Activities Under Section 7 of the Endangered Species Act. Final.

USFWS and NGPC. December 2008. *Conservation Measures for the American Burying Beetle (ABB)*. Provided by the U.S. Fish and Wildlife Service, Nebraska Ecological Services Field Office and Nebraska Game and Parks Commission.

USGS. 2007. *Sturgeon Research Update: Confirmed Pallid Sturgeon Spawning in the Missouri River in 2007*. USGS Fact Sheet 2007-3053. Available online at: http://pubs.usgs.gov/fs/2007/3053/pdf/FS2007-3053.pdf.

———. 2014. "National Land Cover Database 2011 (NLCD 2011)." Multi-Resolution Land Characteristics Consortium (MRLC). May 8. http://www.mrlc.gov/nlcd2011.php.

Wanner, Greg A., Dane A. Shuman, and David W. Willis. 2007a. "Food Habits of Juvenile Pallid Sturgeon and Adult Shovelnose Sturgeon in the Missouri River Downstream of Fort Randall Dam, South Dakota." *Journal of Freshwater Ecology* 22 (1): 81–92.

Wanner, Greg A., Robert A. Klumb, Wayne J. Stancill, and George R Jordan. 2007b. "Habitat Use and Movements of Adult Pallid Sturgeon in the Missouri River Downstream of Fort Randall Dam, South Dakota and Nebraska." Proceedings of the South Dakota Academy of Science 86: 21–33.

Wilcox. April 1959. "A twenty year banding study of the piping plover." *Auk* 76: 129–152.

Wildhaber, Mark L., Aaron J. DeLonay, Diana M. Papoulias, David L. Galat, Robert B. Jacobson, Darin G. Simpkins, Patrick J. Braaten, Carl E. Korschgen, and Michael J. Mac. 2007. *A Conceptual Life-History Model for Pallid and Shovelnose Sturgeon*. Circular 1315. U.S. Geological Survey, Reston, Virginia.

Wilson, Erika C., Wayne A. Hubert, and Stanley H. Anderson. 1993. "Nesting and Foraging of Least Terns on Sand Pits in Central Nebraska." *The Southwestern Naturalist* 38 (1): 9–14.

Ziewitz, Jerry W., John G. Sidle, and John J. Dinan. 1992. "Habitat Conservation for Nesting Least Terns and Piping Plovers on the Platte River, Nebraska." *Prairie Naturalist* 24 (1): 1–20.

A

ESA Section 7
Correspondence
and Species Lists

06E22000-2015-SL-0101

United States Department of the Interior

PLEASE NOTE NEW ADDRESS AS OF 11/1/2014

FISH AND WILDLIFE SERVICE
Ecological Services
Nebraska Field Office
9325 South Alda Road
Wood River, Nebraska 68883

May 1, 2015

FWS-NE: 2015-217

Ms. Rebecca J. Latka, Project Manager
U.S. Army Corps of Engineers
Regulatory Branch
1616 Capitol
Omaha, NE 68102-9000

RE: Official Species List Request, Nebraska Highway 12 Niobrara East and West, Knox County, Nebraska

Dear Ms. Latka:

This responds to the April 3, 2015, request for an updated species list from the U.S. Fish and Wildlife Service (Service) for the subject project. The Service has responsibility for conservation and management of fish and wildlife resources for the benefit of the American public under the following authorities: 1) Endangered Species Act of 1973 (ESA); 2) Fish and Wildlife Coordination Act (FWCA); 3) Bald and Golden Eagle Protection Act (Eagle Act); and 4) Migratory Bird Treaty Act (MBTA). The National Environmental Policy Act requires compliance with all of these statutes and regulations.

In accordance with section 7 of ESA, the Service has determined that the following federally listed species may occur in the proposed project area or be affected by the proposed project:

Listed Species	Expected Occurrence
American burying beetle (*Nicrophorus americanus*) E	Mesic tall-grass prairie and wet meadows
Interior least tern (*Sternula antillarum*) E	Migration and nesting
Northern long eared bat (*Myotis septentrionalis*) T	Forested habitats, man-made structures
Pallid sturgeon (*Scaphirhynchus albus*) E	Missouri and lower Platte rivers

Piping plover (*Charadrius melodus*) T	Migration and nesting
Rufa red knot (*Calidris canutus rufa*) T	Rare, casual migrant
Western prairie fringed orchid T (*Platanthera praeclara*)	Tall-grass prairie and wet meadows
Whooping crane (*Grus americana*) E	Roosting, migrant

All federally listed species under ESA are also State-listed under the Nebraska Nongame and Endangered Species Conservation Act. However, there are also State-listed species that are not federally listed (i.e. river otter and sturgeon chub). To determine if the proposed project may affect State-listed species, the Service recommends that the project proponent contact Michelle Koch (michelle.koch@nebraska.gov) or Carey Grell (carey.grell@nebraska.gov), Nebraska Game and Parks Commission, 2200 N. 33rd Street, Lincoln, NE 68503-0370.

The Service appreciates the opportunity to provide comments on this proposed project. Should you have any questions regarding these comments, please contact Ms. Brooke Stansberry within our office at Brooke_Stansberry@fws.gov or at (308) 382-6468, extension 207.

Sincerely,

Eliza Hines
Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)
NGPC; Lincoln, NE (Attn: Carey Grell)
NPS; Yankton, SD (Attn: John Macy)

From: Simpson, Rachel
To: Schnoor, Meagan
Subject: RE: Nebraska Data for Highway 12 EIS
Date: Wednesday, June 10, 2015 5:00:37 PM

Dear Meagan,

Please see below for results of a search of the Nebraska Natural Heritage Database per your request, using the shapefile you provided which represents your study area. You requested information from the database on ecosystems of special concern, any known occurrences of T&E species in the study area or within 5 miles of the study area, and any bald eagle nesting sites within 0.5 mile of the study area. As we discussed by phone you were looking for a list rather than needing location data. As we discussed by phone, I can provide data but can not provide concurrence on the species list to be evaluated in the N-12 EIS document. See below for information on project review.

We have very little information in the database for this area. We do not have any records in the database for natural communities within the study area. We have historical records from 1893, but no recent records, for Sturgeon Chub (*Macrhybopsis gelida*) and Blacknose shiner (*Notropis heterolepis*). We have no records in the database for other state or federal listed species. The database shows recent Bald Eagle nest sites within 0.5 mile of the study area.

Please be aware that although the Nebraska Natural Heritage database is the most up-to-date and comprehensive database available on the occurrences of rare species and natural communities, there are many areas of the state that have not been inventoried or reported on to the Natural Heritage Program. Similarly, the record of a rare species at a location does not imply that all taxonomic groups have been surveyed at that site or reported to the Natural Heritage Program. As such, the data should be interpreted with caution and an "absence of evidence is not evidence of absence" philosophy followed.

Please note that this correspondence does not satisfy requirements of the Nongame and Endangered Species Conservation Act. Under the authority Neb.Rev.Stat. §37-807 (3) of the Nebraska Nongame and Endangered Species Conservation Act, all Nebraska state agencies are required to consult with the Nebraska Game and Parks Commission to ensure that any actions authorized, funded or carried out by them do not jeopardize the continued existence of a state listed species. This requirement would extend to any state permit issued. Please contact Michelle Koch (Michelle.Koch@nebraska.gov, 402-471-5569) for assistance with determining the potential of an action to affect listed species.

Sincerely,
Rachel

Rachel Simpson, Ph.D.
Data Manager
Nebraska Natural Heritage Program

Nebraska Game and Parks Commission
2200 N. 33rd St.
Lincoln, NE 68503
rachel.simpson@nebraska.gov
402-471-5427

NEBRASKA
GAME PARKS

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641

June 11, 2015

Rebecca Latka
U.S. Army Corps of Engineers
1616 Capitol
Omaha, NE 68102-9000

RE: N-12 Niobrara East and West, Updated Species List

Dear Ms. Latka:

Nebraska Game and Parks Commission staff members have reviewed the information for the proposal identified above. The Corps of Engineers has prepared a list of state-listed threatened and endangered species that may occur within the project area, and is requesting concurrence on the list.

The Corps species list included the following state-listed threatened and endangered species:

American burying beetle (*Nicrophorus americanus*)
Interior least tern (*Sterna antillarum athalassos*)
Northern long-eared bat (*Myotis septentrionalis*)
Lake sturgeon (*Acipenser fulvescens*)
Pallid sturgeon (*Scaphirhyncus albus*)
Piping plover (*Charadrius melodus*)
River otter (*Lontra candensis*)
Rufa red knot (*Calidris canutus rufa*)
Sturgeon chub (*Macrhybopsis gelida*)
Whooping crane (*Grus americana*)

Based on our review, we have verified that these species may occur within the project area and should be evaluated in the Environmental Impact Statement (EIS) for the N-12 Niobrara East and West project.

Thank you for your continued coordination on this project. We look forward to the opportunity to review the Draft EIS when it is available. Please let me know if you have any questions.

Sincerely,

Carey Grell
Environmental Analyst Supervisor
Planning and Programming Division

cc: Michelle Koch, NGPC
Brooke Stansberry, USFWS
Matt Pillard, HDR